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POLYMER FILMS: GAS DIFFUSION (1973 - MAY 82)

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THIS BIBLIOGRAPHY CONTAINS CITATIONS CONCERNING THE DIFFUSION OF GASES THROUGH POLYMERIC FILMS RELATIVE TO THE STRUCTURE AND TYPE OF GAS. EMPHASIS IS PLACED ON METHODS OF MEASURING PERMEABILITY AND THE SELECTIVE TRANSPORT OF GASES. SPECIFIC STUDIES INCLUDE PACKAGING FILMS, REINFORCED POLYMERS, RUBBERS, AND METALLIZED PLASTICS. THE PERMEABILITY OF OXYGEN AND WATER VAPOR THROUGH INSULATION ON WIRES AND CABLES IS ALSO INCLUDED. (CONTAINS 90 CITATIONS)

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SAMPLE CITATION

TITLE--------POLYPHOSPHAZENES - IMPORTANT INORGANIC POLYMERS

ACCESSION----79-01 26261L
NUMBER

AUTHOR-------SINGLER, R. E.   HAGNAUER, G. L.   SCHNEIDER, N. S.

POLYM.NEWS,5,NO.1,SEPT.1978,P.9-17

POLYM. NEWS-5, SEPT. 1978, P.9-17

ABSTRACT-----THE SYNTHESIS OF POLYPHOSPHAZENES AND THEIR CHAIN AND BULK STRUCTURES ARE DESCRIBED. THEIR USE AS FLUOROELASTOMERS AND IN FLAME-RETARDANT APPLICATIONS IS REVIEWED TOGETHER WITH THEIR BIOMEDICAL APPLICATIONS, 34 REFS. 45D

SAMPLE SUBJECT INDEX ENTRY

KEYWORD-------------------FLUOROELASTOMERS

CITATION PAGE NUMBER-----------16   19-01 26261L---ACCESSION NUMBER

ABOUT
RUBBER AND PLASTICS RESEARCH ASSOCIATION

RAPRA IS THE MACHINE-READABLE DATA BASE PRODUCED BY THE RUBBER AND PLASTICS RESEARCH ASSOCIATION OF GREAT BRITAIN. THE TIME SPAN OF THE DATA BASE IS FROM JANUARY 1972 TO PRESENT. THE DATA BASE PROVIDES COVERAGE OF CHEMISTRY AND CHEMICAL ENGINEERING OF POLYMERS (RUBBERS AND PLASTICS). TECHNICAL AND COMMERCIAL ASPECTS OF RUBBER AND PLASTICS ARE COVERED.

THE SOURCES OF THE CITATIONS ARE APPROXIMATELY 60% JOURNAL ARTICLES, 25% PATENTS AND THE REMAINDER FROM MONOGRAPHS, TRADE LITERATURE AND GOVERNMENT REPORTS. ABOUT 20,000 ITEMS ARE ADDED TO THE DATA BASE ANNUALLY, AND THE DATA BASE PRESENTLY CONTAINS ABOUT 150,000 CITATIONS. ABOUT 10 JOURNALS ARE ABSTRACTED IN THEIR ENTIRETY, WITH SELECTIVE ABSTRACTING PERFORMED FROM 400 JOURNAL TITLES REVIEWED FOR INPUT.

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TITLE LIST

CITATIONS

SORPTION AND DIFFUSION OF HYDROCARBON VAPOURS IN GLASSY POLYMERS 82-03 03929L

BARRIE, J. A. WILLIAMS, M. J. L. MUNDAY, K.

POLYM.ENGNG.SCI.,20,NO.1,MID-JAN.1980,P.20-9

SORPTION ISOTHERMS IN THE REGION OF LOW RELATIVE PRESSURES WERE DETERMINED AT SEVERAL TEMPERATURES FOR METHANE, PROPANE AND CHLORODIFLUORCMETHANE IN PS, AND FOR PROPANE IN BISPHENOL A POLYCARBONATE AND POLYVINYL ACETATE. THE RESULTS WERE WELL REPRESENTED BY THE ISOTHERM EQUATION OF DUAL SORPTION THEORY AS APPLIED TO GLASSY POLYMERS. A STUDY WAS MADE OF THE TEMPERATURE DEPENDENCE OF THE ISOTHERM PARAMETERS. THE LANGMUIR COMPONENT TO SORPTION DECREASED AS TG WAS APPROACHED, AND MEASUREMENTS WITH POLYVINYL ACETATE CONFIRMED THAT THIS COMPONENT WAS ABSENT ABOVE THE TRANSITION. AVERAGE DIFFUSION COEFFICIENTS WERE OBTAINED FROM SORPTION (DESORPTION) RATE CURVES AT CONSTANT PRESSURE FOR PROPANE IN PS AND POLYCARBONATE, AND A PROCEDURE WAS DEVELOPED FOR THEIR ANALYSIS TO YIELD THE DIFFUSION COEFFICIENTS OF THE SORBED SPECIES. 24 REFS. 93513

PRESSURE DEPENDENCE OF DIFFUSION COEFFICIENT FOR CARBON DIOXIDE IN GLASSY POLYMERS 82-03 03930L

TOI, K.

POLYM.ENGNG.SCI.,20,NO.1,MID-JAN.1980,P.30-5

THE PRESSURE DEPENDENCE OF THE APPARENT DIFFUSION AND PERMEATION COEFFICIENTS WAS OBSERVED USING THE PERMEATION TIME-LAG METHOD FOR CARBON DIOXIDE IN GLASSY PETP, PS AND PVC BELOW 1 ATM. THE PERMEATION COEFFICIENT WAS CONSTANT, WHEREAS THE DIFFUSION COEFFICIENT INCREASED WITH PRESSURE. IT WAS CONCLUDED THAT THE ADSORBED CARBON DIOXIDE WAS COMPLETELY IMMOBILISED AND DID NOT PARTICIPATE DIRECTLY IN THE DIFFUSION. A COMPUTER WAS USED IN THE NUMERICAL CALCULATION TO DETERMINE THE TRUE DIFFUSION COEFFICIENT FROM THE MODEL OF PAUL ET AL. 10 REFS. 93513

FICKIAN DIFFUSION OF ALKANES THROUGH GLASSY POLYMERS : EFFECTS OF TEMPERATURE, DIFFUSANT SIZE AND POLYMER STRUCTURE
82-03 03931L

CHEN, S. P.   EDIN, J. A. D.

POLYM.ENGNG.SCI.,20,NO.1,MID-JAN.1980,P.40-50

DIFFUSIVITIES (D) RANGING OVER SIX ORDERS OF MAGNITUDE WERE OBTAINED USING A PERMEATION APPARATUS EMPLOYING A GAS FLOW METHOD AND A FLAME IONISATION DETECTOR. LOG D FOR HYDROCARBONS IN BISPHENOL A POLYCARBONATE (PC) AT 120C WAS PROPORTIONAL TO THE SQUARE OF THE MOLECULAR DIAMETER AS GIVEN BY THE LENNARD-JONES POTENTIAL. THIS CORRELATION HELD EVEN FOR THE NON-SPHERICAL N-HEXANE MOLECULE. ACTIVATION ENERGY FOR DIFFUSION WAS ALSO LINEARLY RELATED TO MOLECULAR DIAMETER, WITH VALUES OF 9.5 AND 23 KCAL/MOL FOR METHANE AND NEOPENTANE IN PC, RESPECTIVELY. THE DIFFUSION DATA DID NOT CORRELATE WITH THE TG OF SIMILAR POLYMERS OF HIGHER TG, BUT THE PRESENCE OF SUBSIDIARY TRANSITIONS APPEARED TO ENHANCE SEGMENTAL MOBILITY, INCREASING THE HYDROCARBON RATE OF DIFFUSION. 32 REFS. 43C12-93513

STATISTICAL MECHANICAL MODEL OF SORPTION AND DIFFUSION OF SIMPLE PENETRANTS IN POLYMERS   82-03 03932L

PACE, R. J.   DATYNER, A.

POLYM.ENGNG.SCI.,20,NO.1,MID-JAN.1980,P.51-8

TWO POSSIBLE TYPES OF RANDOM MOTION FOR A SPHERICAL PENETRANT IN AN AMORPHOUS POLYMER ARE DESCRIBED, ONE TYPE DETERMINING THE JUMP FREQUENCY AND ACTIVATION ENERGY OF DIFFUSION, THE OTHER DETERMINING THE JUMP LENGTH. SORPTION OF SIMPLE GASES AT LOW PENETRANT PRESSURES IS ASSUMED TO OCCUR MOSTLY IN PRE-EXISTING HOLES, BOTH ABOVE AND BELOW TG, AND THE SAME PENETRANT DIFFUSION MECHANISM IS ASSUMED TO HOLD IN THE TWO REGIONS. CHANGES IN APPARENT HEAT OF SOLUTION AND ACTIVATION ENERGY OF DIFFUSION OBSERVED AT TG ARE EXPLAINED IN TERMS OF ADDITIONAL HOLE FORMATION WITH INCREASE IN TEMPERATURE ABOVE TG. EVIDENCE IS GIVEN THAT HOLE FORMATION IN SIMPLE POLYMERS SUCH AS PE MAY OCCUR BY CHAIN KINKING, WHILE FOR POLYMERS WITH ARTICULATED SIDE GROUPS IT APPEARS THAT HOLE FORMATION ARISES PRINCIPALLY FROM MOTIONS WITHIN THESE GROUPS. 26 REFS. 93513

SELECTION OF BARRIER MATERIALS FROM MOLECULAR STRUCTURE
82-03 03934L

LEE, W. M.

POLYM.ENGNG.SCI.,20,NO.1,MID-JAN.1980,P.65-9

A PREDICTION TECHNIQUE FOR GAS PERMEABILITY FROM POLYMER MOLECULAR STRUCTURE WAS DEVELOPED ON THE BASIS OF A SPECIFIC FREE VOLUME DIFFUSION THEORY, IN WHICH THE FREE VOLUME AVAILABLE PER UNIT MASS IN A POLYMER STRUCTURE CONTROLS THE RATE OF DIFFUSION AND, HENCE, THE RATE OF PERMEATION OF THE GAS. THE THEORY PREDICTS A LINEAR RELATIONSHIP BETWEEN LOG PERMEABILITY AND SPECIFIC VOLUME, AND A NUMBER OF POLYMERS COVERING SIX ORDERS OF MAGNITUDE IN CARBON DIOXIDE AND OXYGEN PERMEABILITY FOLLOWED THIS CORRELATION. THIS TECHNIQUE GREATLY SIMPLIFIES THE SELECTION OF BARRIER MATERIALS FOR PACKAGING APPLICATIONS. MOLECULAR STRUCTURES WITH STRONG POLAR-TO-POLAR INTERACTIONS AND HYDROGEN BONDING FORCES PROVIDE GOOD BARRIERS TO CARBON DIOXIDE AND OXYGEN. 13 REFS. 93513

OXYGEN TRANSMISSION THROUGH HIGHLY CROSSLINKED POLYMERS
82-03 03935L

GORDON, G. A.   RAVVE, A.

POLYM.ENGNG.SCI.,20,NO.1,MID-JAN.1980,P.70-7

HIGHLY CROSSLINKED POLYMERS OF VARYING STRUCTURE WERE PRODUCED BY REACTION OF POLYGLYCIDYL ACRYLATE AND POLYGLYCIDYL METHACRYLATE WITH CHLORENDIC, GLUTARIC, MALEIC, SUCCINIC AND POLYMALONIC ANHYDRIDE CROSSLINKING AGENTS. TOPOLOGY WAS VARIED BY THE USE OF A DILUENT AND A COMONOMER IN THE BACKBONE CHAIN. OXYGEN PENETRATION MEASUREMENTS WERE MADE ON THESE POLYMERS COATED ONTO A PP FILM BEFORE CROSSLINKING. THE CROSSLINKING PROCESS GREATLY REDUCED THE OXYGEN PERMEABILITY WHICH, HOWEVER, WAS DEPENDENT NOT ONLY ON THE DEGREE OF CROSSLINKING BUT ALSO ON THE CROSSLINK DENSITY, THE CHEMICAL NATURE OF THE STRUCTURAL ELEMENTS, AND THE TOPOLOGY OF THE POLYMER NETWORK. 27 REFS.
42C35-55CAH-93513

VAPOUR-PHASE POLYMERISATION : I. FORMATION OF POLY (
P-PHENYLENETEREPHTHALAMIDE GAS BARRIER COATINGS
82-02 02023L

IKEDA, R. M. ANGELO, R. J. BOETTCHER, F. P. BLOMBERG, R. N. SAMUELS, M. R.

ORG.COATINGS PLAST.CHEM.,VOL.41,SEPT.1979,P.287-92

THIN COATINGS OF POLYPHENYLENE TEREPHTHALAMIDE WERE SYNTHESISED BY VAPOUR PHASE POLYCONDENSATION AND CONCURRENT DEPOSITION ONTO A PET SUBSTRATE. THE COATINGS HAD GOOD RESISTANCE TO PERMEATION BY OXYGEN AND WERE ALSO MOISTURE RESISTANT. 5 REFS. 43C318-6A31-723

INVERSE GAS CHROMATOGRAPHY, A METHOD FOR STUDYING POLYMER-MIGRANT INTERACTIONS IN POLYOLEFIN PACKAGING MATERIALS 82-02 02270L

SENICH, G. A. SANCHEZ, I. C.

ORG.COATINGS PLAST.CHEM.,VOL.41,SEPT.1979,P.345-9

THE USE OF INVERSE PHASE GAS CHROMATOGRAPHY TO MEASURE THE EXTENT OF MIGRATION OF AN IMPURITY OR ADDITIVE FROM A POLYMERIC CONTAINER INTO ITS CONTENTS IS DISCUSSED. THE SPECIFIC RETENTION VOLUME CAN BE USED TO CALCULATE THE POLYMER-MIGRANT INTERACTION PARAMETERS WHICH WHEN COMBINED WITH SOLUBILITY OF THE MIGRANT IN THE SOLVENT, ALLOWS THE EQUILIBRIUM PARTITION COEFFICIENT TO BE CALCULATED. THE DIFFUSION COEFFICIENT OF MIGRANT IN POLYMER CAN BE USED TO ESTIMATE THE DEGREE OF MIGRATION DURING THE EXPECTED SHELF LIFE. THERMODYNAMIC AND KINETIC EFFECTS ARE TAKEN INTO CONSIDERATION. 19 REFS. 42C11-935T

EFFECT OF FILLERS ON THE PROPERTIES OF URETHANE POLYMERS
82-01 00264L

MAIK, M.   KRYSZTAFKIEWICZ, A.

POLIM.TWORZ.WIELK.,26,NO.7,JULY 1981,P.245-7   LANG-POLISH

THE DEPENDENCE OF POLYMER PROPERTIES ON FILLER CONTENT, ON COMPOSITION, THICKNESS AND DENSITY OF THE INTERPHASE LAYER AND ON SURFACE CHARACTERISTICS OF FILLER WAS INVESTIGATED. PARTICULAR ATTENTION WAS PAID TO SILICA FILLERS AND THEIR INFLUENCE ON THE PROPERTIES, E.G. MORPHOLOGY AND GAS PERMEABILITY, OF URETHANE POLYMERS. 35 REFS. 43C6-51SS-9 ARTICLES FROM THIS JOURNAL CAN BE REQUESTED FOR TRANSLATION BY SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

MODEL FOR PERMEATION OF MIXED GASES AND VAPOURS IN GLASSY POLYMERS   82-01 00520L

KOROS, W. J.   CHERN, R. T.   STANNETT, V.   HOPFENBERG, H. B.

J.POLYM.SCI.POLYM.PHYS.,19,NO.10,OCT.1981,P.1513-30

A MODEL WAS DISCUSSED WHICH EXPLAINED COMPLEX EFFECTS OF FEED COMPOSITION AND PRESSURE ON COMPONENT PERMEABILITIES IN HIGH-PRESSURE GAS SEPARATORS BASED ON GLASSY POLYMER MEMBRANES. PERMEATION OF GAS MIXTURES WAS ANALYSED ON THE BASIS OF A FORM OF FICK'S LAW WHICH ACCOUNTS FOR THE FACT THAT PENETRANTS IN GLASSY POLYMERS SORB INTO AND DIFFUSE THROUGH TWO DIFFERENT MOLECULAR ENVIRONMENTS. POTENTIAL DEVIATIONS FROM THE THEORY WERE DISCUSSED IN TERMS OF SEPARABLE EFFECTS DUE TO GAS SOLUBILITY AND MOLECULAR MOBILITY. 47 REFS. 6M-93513

INFLUENCE OF PETROLEUM GAS ON THE DIFFUSION PROPERTIES OF POLYMERIC MEMBRANES 81-12 79071L

OLENINA, Z. K. ERSHOV, B. N. BRESHCHENKO, E. M.

PLAST.MASSY,NO.5,1980,P.29 LANG- RUSSIAN

A STUDY IS DESCRIBED OF THE PERMEABILITY OF A MEMBRANE MADE FROM POLYPROPYLENE AND A FLUORINE-CONTAINING PLASTIC UNIRRADIATED AND IRRADIATED WITH ARGON IONS AFTER PROLONGED TREATMENT WITH PETROLEUM GAS. 5 REFS. 42C12-6M-93513 ARTICLES FROM THIS JOURNAL CAN BE REQUESTED FOR TRANSLATION BY SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

GAS PERMEATION THROUGH POROUS POLYMERIC MEMBRANE 81-11 77873L

KAMIDE, K. MANABE, S. NOHMI, T. MAKINO, H. KAWAI, T.

POLYM.PREPRINTS,21,NO.2,AUG.1980,P.90-2

THE GAS FLOW MECHANISM IN POLYMERIC MEMBRANES HAVING VARIOUS TYPES OF PORE SIZE DISTRIBUTION WAS STUDIED. 11 REFS. 6M-93513

SILICONE RUBBER TECHNOLOGY REVIEW 81-11 76608C

POLMANTEER, K. E.

MINNEAPOLIS,MINN.,JUNE 2-5,1981,PAPER 1,PP.64. PREPRINT. 012 PUBLCN. DETAILS- ACS,RUBBER DIV. 119TH MEETING,SPRING 1981. PAPERS

A REVIEW IS PRESENTED OF THE CHEMICAL STRUCTURE, SYNTHESIS, VULCANISATION, SOLUBILITY, SURFACE ENERGY, PERMEABILITY, OXIDATION, HYDROLYSIS AND RHEOLOGICAL AND LOW TEMPERATURE PROPERTIES OF SILICONE RUBBERS, INCLUDING POLYDIMETHYLSILOXANE AND SILOXANE COPOLYMERS. FILLERS AND THEIR EFFECTS ON MECHANICAL PROPERTIES ARE ALSO CONSIDERED. 28 REFS. 45C

PERMEATION OF GASES THROUGH MODIFIED POLYMER FILMS. V. PERMEATION AND DIFFUSION OF HELIUM, NITROGEN, METHANE, ETHANE AND PROPANE THROUGH GAMMA-RAY CROSSLINKED POLYETHYLENE 81-11 76102L

MACDONALD, R. W. HUANG, R. Y. M.

J.APPL.POLYM.SCI.,26,NO.7,JULY 1981,P.2239-63

GAMMA-IRRADIATION OF PE FILMS WAS CARRIED OUT IN VACUUM, ACETYLENE AND ACETYLENE-NITROGEN MIXTURES IN ORDER TO STUDY THE CHANGES INDUCED IN EFFICIENCY OF CROSSLINKING AND TRANSPORT PROPERTIES WITH IRRADIATION DOSE AND ATMOSPHERE. PERMEABILITY AND DIFFUSION CONSTANTS WERE OBTAINED FOR HELIUM, NITROGEN, METHANE, ETHANE AND PROPANE AND THE PLASTICISING EFFECT OF THE HYDROCARBON GASES INVESTIGATED. 50 REFS. 42C11-8953-93513

POLYMER BREAKS THE GAS BARRIER 81-10 75169L

PLAST.RUBB.WKLY.,NO.901,22ND AUG.1981,P.5 CORP. AUTH-KANEGAFUCHI CHEMICAL INDUSTRY CO.

BRIEF DETAILS ARE PRESENTED ON KANEKA PARNEX, AN AMORPHOUS ACRYLIC COPOLYMER, WHICH IS REPORTED TO HAVE EXCELLENT CHEMICAL RESISTANCE AND HIGH GAS BARRIER PROPERTIES. THE MATERIAL CAN BE INJECTION, EXTRUSION OR BLOW MOULDED, VACUUM FORMED OR CALENDERED. APPLICATIONS, INCLUDING PACKAGING, PUMPS, ELECTRICAL COMPONENTS AND PETROL CAPS, ARE MENTIONED. 42C351A-9351

DIFFUSION OF GASES IN GLASSY POLYMERS. II. DUAL SORPTION THEORY 81-07 69357L

NAPP, S. J. PEPPAS, N. A.

POLYM.NEWS,7,NO.4,1981,P.174-7

THE ABILITY OF THE DUAL MODE THEORY TO PREDICT AND CORRELATE A RANGE OF MASS TRANSPORT PROCESSES WHERE ONE POPULATION IS IMMOBILE RELATIVE TO ANOTHER IS EXAMINED. 17 REFS. 93513

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BODRI, E. KOVACS, B. ZIEGLER, B.

MUANYAG ES GUMI.,18,NO.3,1981,P.85-7 LANG- HUNGARIAN

DERIVATOGRAPH RECORDS SHOW THAT THE THERMAL DECOMPOSITION OF PVC PRODUCED BY BULK POLYMERISATION AND SUSPENSION POLYMERISATION IS EXOTHERMIC AND ENDOTHERMIC, RESPECTIVELY. THE DIFFERENCE IS DUE TO THE PERICELLULAR SURFACE SKIN FOUND ON SUSPENSION PVC GRANULES WHICH HINDERS THE ACCESS OF OXYGEN, WHILE IN THE CASE OF BULK PVC GRANULES OXYGEN IS ABLE TO CONTACT PRIMARY GRANULES UNRESISTED. 9 REFS. 42C382-622-932 ARTICLES FROM THIS JOURNAL CAN BE REQUESTED FOR TRANSLATION BY SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

EFFECT OF TENSILE DEFORMATIONS ON CASE TRANSPORT IN GLASSY POLYMER FILMS 81-06 67207L

SMITH, T. L. ADAM, R. E.

POLYMER,22,NO.3,MARCH 1981,P.299-304

THE EFFECT OF SIMPLE TENSILE DEFORMATIONS ON THE PERMEABILITY AND DIFFUSION COEFFICIENTS OF GASES IN GLASSY POLYMERS WAS STUDIED. THE FILMS USED WERE POLYCARBONATE AND POLYIMIDE WITH CARBON DIOXIDE AND NITROGEN. FOR NITROGEN IN PC THE COEFFICIENTS DECREASED WITH TIME AT CONSTANT STRAIN AND WERE PARTIALLY DEPENDENT ON STRAIN AND THERMAL HISTORIES. FOR CARBON DIOXIDE IN POLYIMIDE, THE COEFFICIENTS INCREASED WITH STRAIN UP TO 2% AT 125C AND THEN DECREASED, SHOWING A STRAIN-INDUCED RELAXATION. 41 REFS. 43C12-93513

EFFECT OF VARIOUS FACTORS ON THE PERMEABILITY OF GASES THROUGH POLYMER FILMS. III. PROPERTIES OF FILMS PREPARED FROM MODIFIED POLYSTYRENE AND PVC 81-05 65408L

KAMINSKA, A.

POLIM.TWORZ.WIELK.,25,NO.12,1980,P.442-4 LANG- POLISH

THE EFFECT OF METHYL METHACRYLATE-BUTADIENE-STYRENE COPOLYMERS (MBS) AND SAN AS MODIFIERS ON THE PERMEABILITY TO AIR OF FILMS OF PVC AND PS, AS WELL AS ON THE UV STABILITY OF SUCH FILMS, WAS INVESTIGATED. ADDITION OF 1 TO 3% MBS OR SAN WAS FOUND TO REDUCE THE PERMEABILITY OF PS AND INCREASE THAT OF PVC; RESISTANCE TO UV IRRADIATION WAS REDUCED IN BOTH POLYMERS. PERMEABILITY MEASUREMENT APPEARED TO BE A SENSITIVE METHOD FOR DETECTING CHANGES IN THE STRUCTURE OF POLYMERS. 5 REFS. 93513 ARTICLES FROM THIS JOURNAL CAN BE REQUESTED FOR TRANSLATION BY SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

DIFFUSION OF GASES IN GLASSY POLYMERS. I. FREE VOLUME AND ENERGY FLUCTUATION THEORIES 81-05 66434L

NAPP, S. J. PEPPAS, N. A.

POLYM.NEWS,7,NO.3,JAN.1981,P.118-21

THE FREE VOLUME AND ENERGY FLUCTUATION THEORIES WHICH DESCRIBE THE KINETICS OF GASEOUS TRANSPORT IN HOMOPOLYMERS ARE BRIEFLY DISCUSSED. A MORE DETAILED DISCUSSION OF THE DUAL SORPTION THEORY IS ALSO GIVEN. 12 REFS. 93513

BUTYL RUBBER AND ITS USE IN NON-TYRE APPLICATIONS 81-02 59593L

RITCHIE, K.

HULE MEX.PLAST.,36,NO.414,JULY 1980,P.5/18 LANG- SPANISH

THE CHEMICAL STRUCTURE AND PREPARATION OF BUTYL RUBBER AND

HALOBUTYL RUBBERS IS DISCUSSED, AND THE MAIN PROPERTIES OF THESE MATERIALS ARE REVIEWED, I.E. GAS PERMEABILITY, THERMAL STABILITY, OZONE RESISTANCE, ENERGY ABSORPTION AND CHEMICAL RESISTANCE. ATTENTION IS ALSO PAID TO COMPOUNDING, CURING SYSTEMS AND OTHER COMPOUNDING INGREDIENTS. APPLICATIONS EXAMINED INCLUDE PHARMACEUTICAL STOPPERS, VEHICLE SUSPENSIONS, TANK LININGS, MEMBRANES, ELECTRICAL CONDUCTORS, POLYMERIC PROPERTY MODIFIERS FOR PLASTICS, FOOTBALL BLADDERS, SEALANTS AND CONVEYOR BELTING. FORMULATIONS FOR THESE APPLICATIONS ARE GIVEN, WITH PARTICULAR REFERENCE TO POLYMERS PRODUCED BY POLYSAR LTD. 7 REFS. 42C131012

SELECTIVE TRANSPORT OF SULPHUR DIOXIDE THROUGH POLYMER MEMBRANES. I. POLYACRYLATE AND CELLULOSE TRIACETATE SINGLE LAYER MEMBRANES 81-01 58208L

KUEHNE, D. L. FRIEDLANDER, S. K.

TEC PROCESS DES.DEV.,19,NO.4,OCT.1980,P.609-16

COMMERCIAL SAMPLES OF POLYACRYLATE AND CELLULOSE TRIACETATE POLYMERS WERE FOUND TO BE SELECTIVELY PERMEABLE TO SULPHUR DIOXIDE GAS. ULTRA THIN FILMS WERE PREPARED TO ACHIEVE HIGH SO2 FLUXES, REQUIRED FOR SO2 GAS SEPARATORS. SO2 PERMEABILITY HAD A LARGE PRESSURE DEPENDENCE, WHICH ADVERSELY AFFECTED MEMBRANE PERFORMANCE. 18 REFS. 6M-93513

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KUEHNE, D. L. FRIEDLANDER, S. K.

IEC PROCESS DES.DEV.,19,NO.4,OCT.1980,P.616-23

A NOVEL TECHNIQUE IS DESCRIBED FOR PREPARING POLYACRYLATE/CELLULOSE TRIACETATE POLYMER MEMBRANES FOR SO2 GAS SEPARATIONS. SO2 PERMEATION DATA WERE OBSERVED TO BE PRESSURE DEPENDENT. A CONTINUOUS FLOW SYSTEM WAS BUILT TO MODEL THE GAS FLOW IN A MEMBRANE SEPARATOR, AND SELECTED MEMBRANES WERE TESTED WITH BINARY MIXTURES OF N2 AND SO2. MEMBRANE PERFORMANCE WAS EVALUATED IN TERMS OF DESIGN GOALS FOR COMBUSTION AND SMELTER GAS APPLICATIONS. 6 REFS.

6M-93513

EFFECT OF VARIOUS FACTORS ON THE PERMEABILITY OF GASES THROUGH POLYMER FILMS. II. CHANGES IN THE PERMEABILITY OF AIR THROUGH POLYSTYRENE FILMS UNDER THE EFFECT OF UV IRRADIATION 80-12 57154L

KAMINSKA, A. MLYNARCZYK, D.

POLIM.TWORZ.WIELK,25,NO.8,AUG.1980,P.289-90

POLISH. PHOTOCHEMICAL REACTIONS TAKING PLACE IN PS, WHICH CHANGE THE MOLECULAR STRUCTURE AND THE STRUCTURE OF THE FILMS, AFFECT THE PERMEABILITY OF PS FILMS. CROSSLINKING DECREASES, AND DEGRADATION AND BRANCHING INCREASE THE PERMEABILITY. THE DIFFERENCES IN CHANGES IN PERMEABILITY OF PS FILMS OF DIFFERENT MOLECULAR WEIGHT AND POLYMOLECULARITY SUGGEST THAT THE COURSE OF PHOTOCHEMICAL PROCESSES DEPENDS ON BOTH THESE PARAMETERS. A DECREASE IN RESISTANCE TO THE ACTION OF UV IRRADIATION IS OBSERVED WITH INCREASING PS POLYMOLECULARITY. IT IS CONCLUDED THAT THE DETERMINATION OF CHANGES IN PERMEABILITY OF FILMS MAY BE USED TO EXAMINE THE COURSE OF PHOTOCHEMICAL PROCESSES IN POLYMER FILMS. 5 REFS. ARTICLES FROM THIS JOURNAL CAN BE REQUESTED FOR TRANSLATION BY SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

GAS PERMEABILITY OF HIGH POLYMERS PARTICULARLY OF RUBBERS 80-12 57566L

SCHUCK, H.

KAUT.U.GUMMI KUNST.,33,NO.9,SEPT.1980,P.705-15

GERMAN. THE RUBBERS STUDIED INCLUDE POLYISOBUTYLENE, SILICONE RUBBER AND NR. 17 REFS.

POLYMERISATION FROM THE VAPOUR PHASE. I. POLY-P-PHENYLENETEREPHTHALAMIDE (PPTA) GAS BARRIER COATINGS 80-11 55870L

IKEDA, R. M. ANGELO, R. J. BOETTCHER, F. P. BLOMBERG, R. N. SAMUELS, M. R.

J.APPL.POLYM.SCI.,25,NO.7,JULY 1980,P.1391-405

AN ATMOSPHERIC-PRESSURE, VAPOUR-PHASE POLYMERISATION TECHNIQUE WAS USED TO DEPOSIT THIN PPTA COATINGS ONTO SHEET SUBSTRATES. A MINIMUM DEPOSITION TEMP. OF 170C WAS FOUND TO BE CRITICAL. THESE COATINGS EXHIBITED GOOD OXYGEN BARRIER PROPERTIES AND WERE FOUND TO CONSIST OF FUSED 0.1 MU M PARTICULATES. SEM OF THE TOP SURFACES OF THE COATINGS REVEALED THEIR PARTICULATE ORIGIN. SIMILAR EVIDENCE WAS ALSO OBTAINED FROM SEM EXAMINATION OF FRACTURE SURFACES AND TRANSMISSION ELECTRON MICROSCOPY OF MICROTOMED SECTIONS. THE COALESCENCE OF THESE COATINGS WAS SHOWN BY SEM OF PLASMA-ETCHED SURFACES AND OXYGEN PERMEABILITY DATA. THE UNIPLANAR ORIENTATION OF THE POLYMER CRYSTALS IN THESE COATINGS WAS STRONG EVIDENCE FOR THE EPITAXIAL GROWTH OF THE CRYSTALS. 5 REFS.

POLYMER MEMBRANE ELECTRODE BASED POTENTIOMETRIC AMMONIA GAS SENSOR 80-11 55922L

MEYERHOFF, M. E.

ANALYT.CHEM.,52,NO.9,AUG.1980,P.1532-4

A DESCRIPTION IS GIVEN OF THE INCORPORATION OF THE ANTIBIOTIC NONACTIN INTO AN APPROPRIATE PLASTICISER/PVC MEMBRANE ELECTRODE AND THEN USED AS THE INNER ELECTRODE IN A GAS SENSING ARRANGEMENT FOR DISSOLVED AMMONIA. 7 REFS.

POSSIBLE MECHANISM OF SELECTIVITY OF DIFFUSION OF MOLECULAR GASES IN POLYMERS 80-11 54673L

BRUEV, A. S.

POLYM.SCI.USSR,21,NO.5,1979,P.1256-66

A STUDY WAS MADE OF THE DIFFUSION OF NON-SPHERICAL MOLECULES IN POLYMER FILMS. IT WAS SHOWN THAT THE CORRELATION BETWEEN THE DIRECTION OF CHANGE IN DIFFUSION AND MOLECULAR ORIENTATION IN THE CASE OF DIATOMIC AND LINEAR MOLECULES COULD INCREASE THE RATE OF DIFFUSION TRANSFER. RESULTS WERE IN AGREEMENT WITH EXPERIMENTAL DATA CONCERNING THE DIFFUSION OF MOLECULAR GASES IN POLYMERS. 25 REFS.

ELASTOMERE AUF BASIS ATHYLEN-PROPYLEN 80-10 53121A

42C11C12 CORP. AUTH- WIRTSCHAFTSVERBAND DER DEUTSCHER KAUTSCHUKIND. PUBLCN. DETAILS- GRUNES BUCH 39

GERMAN. THIS BOOK CONTAINS SECTIONS ON THE POLYMERISATION OF ETHYLENE-PROPYLENE RUBBER, MONOMERS, CATALYSTS AND POLYMERISATION KINETICS; THE MOLECULAR STRUCTURE AND MORPHOLOGY OF THE ELASTOMERS, E.G. MWD, TG, CRYSTALLINITY, RHEOLOGICAL PROPERTIES, THE VULCANISATION OF EPM AND EPDM, CURING AGENTS AND CROSSLINKING REACTIONS, PROCESSING, EXTRUSION, CALENDERING, MIXING, FILLERS AND ADDITIVES, BLENDS OF THE ELASTOMERS WITH OTHER POLYMERS, CHEMICAL RESISTANCE, AGEING, FLAMMABILITY, GAS PERMEABILITY, BLOCK COPOLYMERS, AND THERMOPLASTIC ELASTOMERS BASED ON ETHYLENE-PROPYLENE, AND APPLICATIONS FOR ETHYLENE PROPYLENE ELASTOMERS, E.G. BUILDING APPLICATIONS, SEALING STRIPS, SPORTS SURFACES, ELECTRIC CABLES, PROTECTIVE COATINGS AND ADHESIVES. A LIST OF PATENTS AND DETAILS OF FORMULATIONS ARE GIVEN. 863 REFS.

OPPORTUNITIES IN CRIENTED NITRILE RESIN CONTAINERS
80-09 52281L

CARLSON, J. A.   BORLA, L.

MOD.PLAST.INT.,1C,NO.6,JUNE 1980,P.38-40

CONSIDERATION IS GIVEN TO THE PRODUCTION OF BOTTLES AND OTHER CONTAINERS FOR BEVERAGES, FOODSTUFFS, ETC., BY ORIENTATION BLOW MOULDING OF ACRYLONITRILE COPOLYMERS, I.E. COPOLYMERS OF ABCLT 70% ACRYLONITRILE WITH ACRYLATES OR STYRENE, POSSIBLY CONTAINING ELASTOMERIC IMPACT MODIFIERS. THE ACRYLONITRILE MONOMER PROVIDES HIGH TENSILE STRENGTH, STIFFNESS, GAS BARRIER AND CHEMICAL RESISTANCE PROPERTIES, AND THE COMONOMER CONTRIBUTES PROCESSIBILITY. DATA ARE PRESENTED ON TEMPERATURE AND DRAW RATIO FACTORS WHICH CONTROL ENHANCEMENT OF MECHANICAL PROPERTIES AND PERMEABILITY CHARACTERISTICS DURING ORIENTATION. COMMERCIALLY AVAILABLE COPOLYMERS ARE BAREX 210 (VISTRON CORP.) AND SOLTAN (SOLVAY & CIE.). DEVELOPMENTS IN PROCESSING METHODS AND MARKET POTENTIALS FOR SUCH CONTAINERS ARE SURVEYED.

GAS EOUS DIFFUSICN AND PERMEATION IN CLOSED-CELL POLYMERIC FOAMS   80-09 52620C

MEHTA, B. S.   COLOMBO, E. A.

WASHINGTON,D.C.,APRIL 1978,P.689-92. CONFER. 012   PUBLCN. DETAILS- SOC.PLAST.ENGRS. 36TH ANNUAL TECHNICAL CONFERENCE

A QUANTITATIVE EXPLANATION IS PRESENTED OF THE EFFECT OF TEMP., BLOWING GAS CONCENTRATION AND STRUCTURAL CHARACTERISTICS, SUCH AS CELL SIZE AND CELL ORIENTATION, ON GASEOUS DIFFUSION AND PERMEATION OF CLOSED-CELL PS FOAM. 8 REFS. 42C21-6124-93513

GAS PERMEABILITY OF POLYMERIC MEMBRANES 80-08 51719L

BELEN'KAYA, N. M. BUBLEVSKII, I. M. GARNIZOVA, A. N.

PLAST.MASSY,NO.10,1979,P.60

RUSSIAN. 2 REFS. ARTICLES FROM THIS JOURNAL CAN BE REQUESTED FOR TRANSLATION BY SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

PERMEATION OF GASES AND VAPOURS THROUGH POLYMER FILMS AND THIN SHEET. I. 80-08 51211L

LOMAX, M.

POLYM.TEST.,1,NO.2,APRIL/JUNE 1980,P.105-47

A REVIEW IS MADE OF TECHNIQUES FOR MEASURING THE PERMEATION OF GASES AND VAPOURS THROUGH POLYMER FILMS AND THIN SHEETS. 67 REFS.

EFFECT OF VARIOUS FACTORS ON GAS PERMEABILITY OF POLYMERIC FILMS. I. AIR PERMEABILITY OF POLYSTYRENE FILMS 80-07 50126L

KAMINSKA, A.

POLIM.TWORZ.WEILK.,25,NO.2,FEB.1980,P.47-8

POLISH. THE PERMEABILITY TO AIR OF PS FILMS PREPARED BY CASTING POLYMER SOLUTIONS ON GLASS PLATES AND EVAPORATING THE SOLVENT WAS DETERMINED. FILMS WERE PREPARED FROM PS FRACTIONS OF DIFFERING MOLEC.WT. AND FROM MIXTURES OF FRACTIONS EXHIBITING SIMILAR INTRINSIC VISCOSITY BUT DIFFERENT POLYDISPERSITY. AIR PERMEABILITY WAS FOUND TO INCREASE WITH INCREASE IN MOLEC.WT. AND WITH BROADENING OF MWD. 18 REFS. ARTICLES FROM THIS JOURNAL CAN BE REQUESTED FOR TRANSLATION BY SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

GAS PERMEABILITY CF METALLISED POLYMER FILMS
80-06 48608L

KAPANIN, V. V. REITTLINGER, S. A. STRUNINA, O. B.
PRILIPOV, V. V.

VYS.SOED.B,19,NO.12,DEC.1977,P.903-8

RUSSIAN. THE GAS PERMEABILITY OF A LAMINATE CONSISTING OF PE FILM SANDWICHEC BETWEEN, ON EACH SIDE, A LAYER OF ALUMINIUM AND A LAYER OF PETP WAS INVESTIGATED AND PROMISING RESULTS OBTAINED. 5 REFS.

DETERMINATION OF THE SOLUBILITY OF GASES IN POLYMER FILMS BY GAS CHROMATOGRAPHY 80-06 48962L

KAPANIN, V. V. SIROTIN, Y. A. D. REITLINGER, S. A.
PRILIPOV, V. V.

POLYM.SCI.USSR,21,NO.2,1979,P.500-2

SOLUBILITY COEFFICIENTS ARE DETERMINED FOR HELIUM, OXYGEN, ARGON AND NITROGEN IN LDPE FILMS. THESE RESULTS SHOWED SATISFACTORY AGREEMENT WITH RESULTS IN THE LITERATURE. 9 REFS.

INFLUENCE OF ADDITION OF OLIGOMER IC VINYLALKYLDIMETHYL SILANES ON THE GAS PERMEABILITY OF POLYVINYL TRIMETHYLSILANE
80-06 49196L

EVSEENKO, A. L. TEPLYAKOV, V. V. DURGAR'YAN, S. G.
NAMETKIN, N. S.

VYS.SOED.B,21,NO.2,1979,P.153-5

RUSSIAN. 5 REFS. ARTICLES FROM THIS JOURNAL CAN BE REQUESTED FOR TRANSLATION BY SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

IRRADIATION EFFECT ON GAS DIFFUSION IN POLYMER FILMS. I. HYDROGEN DIFFUSION THROUGH MYLAR FILM   80-06 47953C

RAO, K. A.   PUSHPA, K. K.   IYER, R. M.

GUJARAT,FEB.1979,PP.1. CONFER. 012   PUBLCN. DETAILS- INDIA,BOARD OF RES.NUCLEAR SCI.INDUS.POLYM.& RADIAT.SYMPOS.

(ABSTRACT ONLY). 43C112-625-93513

ISOTOPE EFFECT IN THE DIFFUSION OF HYDROGEN AND DEUTERIUM IN POLYMERS   80-06 48299L

TOI, K.   TAKEUCHI, K.   TOKUDA, T.

J.POLYM.SCI.POLYM.PHYS.,18,NO.2,FEB.1980,P.189-98

TEMPERATURE DEPENDENCES OF DIFFUSION AND PERMEATION COEFFICIENTS OF HYDROGEN AND DEUTERIUM IN GLASSY AND RUBBERY POLYMER FILMS WERE MEASURED. THE SIZE OF THE FREE VOLUME ELEMENT IN RUBBERY POLYMERS WAS CALCULATED ACCORDING TO THE THEORY OF FRISCH AND ROGERS FOR THE QUANTUM ISOTOPE EFFECT, BUT THE FREE VOLUME WAS TOO LARGE FOR PRECISE CALCULATION BELOW THE TG. THE COOPERATIVE MOVEMENT OF SEGMENTS IS ALSO DISCUSSED USING THE RATIO OF PRE-EXPONENTIAL FACTORS FOR DIFFUSION MECHANISMS ABOVE AND BELOW THE TG. 7 REFS. 93513

ENTROPY CORRELATION THEORY AND DIFFUSION MEASUREMENTS FOR ORIENTED POLYMERS   80-04 45453L

BARKER, R. E.   TSAI, R. C.   WILLENCY, R. A.

J.POLYM.SCI.POLYM.SYMP.,NO.63,1978,P.109-29

THE ENTROPY CORRELATION THEORY PREDICTS THAT ANY STRUCTURAL CHANGE WHICH DECREASES THE CONFIGURATIONAL ENTROPY OF A COMPLEX MOLECULAR SYSTEM WILL LEAD TO AN APPROXIMATELY EQUAL INCREASE IN THE ACTIVATION ENTROPY FOR STRUCTURALLY CONTROLLED RATE PROCESSES SUCH AS DIFFUSION. CONFIRMATION OF THE THEORY IS PRESENTED FOR THE CASE OF GAS DIFFUSION IN PERMANENTLY STRETCHED POLYMERIC MEMBRANES. SYSTEMS

INVESTIGATED INCLUDED REPRESENTATIVE POLYALKYL METHACRYLATES AND A SELECTION CF NON-POLAR AND PCLAR GASES. 35 REFS. 93513

ENERGETICS OF GAS SORPTION IN GLASSY POLYMERS 79-12 39757L

KOROS, W. J. PAUL, D. R. HUVARD, G. S.

POLYMER,20,NC.8,ALG.1979,P.956-60

AN ANALYTICAL EXPRESSION WAS DERIVED FOR PREDICTION OF THE MOLAR ENTHALPY OF SORPTION AT CONSTANT CONCENTRATION IN DUAL MODE SORPTION SYSTEMS. THE EXPRESSION WAS SHOWN TO PROVIDE A GOOD DESCRIPTICN OF DATA DERIVED BY FORMAL THERMODYNAMIC ANALYSIS OF CARBCN DIOXIDE SORPTION ISOTHERMS IN PETP. 13 REFS. 93513

PERMEABILITY OF METALLISED POLYMER FILMS. I. METHOD FOR GAS PERMEABILITY MEASUREMENT 79-12 39758L

SPRINGER, J. BRITO, H.

J.APPL.POLYM.SCI.,24,NO.2,15TH JULY 1979,P.329-37

GERMAN. THE CONSTRUCTION AND OPERATION OF AN APPARATUS FOR THE DETERMINATION OF GAS PERMEABILITY THROUGH METALLISED POLYMER FILMS IS DESCRIBED. THE TEST GASES (NITROGEN, OXYGEN AND CARBON DIOXIDE) PENETRATE UNDER PRESSURE DIFFERENCES FROM 100 TORR TO 20 BAR THROUGH METALLISED ABS FILMS. THE METAL LAYERS CONSIST OF CHEMICALLY DEPOSITED NICKEL AND GALVANIC DEPOSITED COPPER. THE QUANTITY OF PERMEATED GASES IS DETERMINED BY GAS CHROMATOGRAPHY, AND LEAK EFFECTS CAN BE MEASURED QUANTITATIVELY. THE PERMEABILITY OF GAS MIXTURES, I.E. AIR, CAN ALSO BE INVESTIGATED. THE APPARATUS ALLOWS THE DETERMINATION OF EXTREMELY LOW PERMEABILITY RATES AS WELL AS THOSE FOR CONVENTIONAL POLYMER SYSTEMS. 29 REFS. .293513T

PROPERTIES AND APPLICATIONS OF POLYMER ALLOYS
79-11 38007L

GRECO, R. MARTUSCELLI, E.

CHIMICA E IND.,61,NO.4,APRIL 1979,P.298-309.

ITALIAN. THE CLASS OF MATERIALS CONSIDERED INCLUDES POLYMER BLENDS, GRAFT COPOLYMERS, BLOCK COPOLYMERS AND INTERPENETRATING POLYMER NETWORKS. AN EXAMINATION IS MADE OF THERMODYNAMIC COMPATIBILITY, HOMOGENEITY, ELASTIC MODULUS, RUPTURE RESISTANCE, IMPACT PROPERTIES, ABRASION RESISTANCE, THERMAL PROPERTIES, THERMAL AND LIGHT DEGRADATION, FLAMMABILITY, GAS AND VAPOUR PERMEABILITY OF FILMS AND MEMBRANES, CRYSTALLISATION KINETICS, RECYCLING, AND COUPLING AGENTS. MAJOR PROBLEMS TO BE SOLVED INCLUDE HETEROGENEITY AND INCOMPATIBILITY, AND COUPLING AGENTS AND/OR INTERFACIAL PROPERTY MODIFIERS NEED TO BE DEVELOPED. 36 REFS. 6125

WEATHERING PROPERTIES OF POLYMERS IN CABLES 79-11 38147L

CHEVASSUS, F.

HULE MEX.PLAST.,34,NO.397,FEB.1979,P.5/20

SPANISH. A DETAILED STUDY IS MADE OF THE EFFECTS OF WEATHERING ON RUBBER AND PLASTICS CABLE INSULATION, WITH REFERENCE TO CABLES OF ALL TYPES. THE ACTION OF LIGHT AND OF LIGHT STABILISERS, HUMIDITY, OZONE AND OTHER GASES IS CONSIDERED FOR DIFFERENT POLYMERS, AND ELECTRICAL PROPERTIES ARE DISCUSSED. 6E1-93

EVAPORATION OF PCLYMER- SOLVENT MIXTURES. DETERMINATION OF VAPOUR PRESSURES FROM GAS EOUS DIFFUSION COEFFICIENTS
79-10 37611L

COCA, J. BUENO, J. L. ALVAREZ, R.

POLYM.BULL.,1,NO.7,MAY 1979,P.459-64

THE STEFAN-WINKELMANN DIFFUSION TECHNIQUE WAS USED TO DETERMINE VAPOUR PRESSURES OF HIGH BOILING POINT COMPOUND/SOLVENT MIXTURES. DATA ARE REPORTED AT A TEMP. OF 67C FOR THE MIXTURES POLYPHENYL ETHER (6 RINGS)/BENZENE AND CARBOWAX 1500/BENZENE AND AT 100C FOR POLYPHENYL ETHER/TOLUENE AND TRICRESYL PHOSPHATE/TOLUENE. THE RANGE OF CONCENTRATION WAS ONLY LIMITED BY THE APPEARANCE OF A SOLID PHASE AND RESULTS WERE IN GOOD AGREEMENT WITH THOSE DETERMINED BY VAPCUR-PRESSURE OSMOMETRY. 6 REFS.
43C52-93513T

EVALUATION OF RESULTS OF SIMPLIFIED DETERMINATION METHODS OF POLYMER MEMBRANE PERMEABILITY TO VAPOURS 79-10 36773L

IZYDORCZYK, J. PODKOWKA, J. SALWINSKI, J.

J.APPL.POLYM.SCI.,23,NO.8,15TH APRIL 1979,P.2265-9

PERMEABILITY COEFFICIENTS FOR SOME SELECTED SYSTEMS COMPRISING A POLYMER MEMBRANE AND ORGANIC VAPOURS WERE MEASURED BY SIMPLIFIED METHODS, WITH THE AIM OF EVALUATING THE SUITABILITY OF THESE TECHNIQUES FOR MEMBRANE PERMEABILITY DETERMINATION UNDER AVERAGE CONDITIONS OF USE. RESULTS OBTAINED BY WEIGHED CELL, CAPILLARY EVAPORATION AND ELECTROCHEMICAL METHODS WERE COMPARED AND ANALYSED, TAKING INTO ACCOUNT PERMEATION MODELS ASSOCIATED WITH DIFFERENT APPARATUS AND OPERATION PRINCIPLES AS WELL AS DIFFERENT MEASURING CONDITIONS. FOR SIMILAR MASS TRANSFER MODELS, PERMEABILITY COEFFICIENT VALUES OF THE SAME ORDER AND CLOSE ACCURACY OF MEASUREMENT WERE OBTAINED. 8 REFS. 6M-93513

PERMEABILITY OF OXYGEN THROUGH POLYMERS. I. A NOVEL SPECTROPHOTOCHEMICAL METHOD 79-10 36776L

PETRAK, K.

J.APPL.POLYM.SCI.,23,NO.8,15TH APRIL 1979,P.2365-71

A NEW METHOD FOR THE MEASUREMENT OF OXYGEN PERMEABILITY THROUGH POLYMER MEMBRANES IS BASED ON MONITORING THE SENSITISED PHOTO-OXYGENATION OF A SINGLET OXYGEN ACCEPTOR IN A DETECTOR LAYER SANDWICHED BETWEEN A SUPPORT AND THE POLYMER LAYER. THE DETECTOR LAYER CONTAINS A SENSITISER WHICH ON IRRADIATION PRODUCES SINGLET EXCITED OXYGEN FROM THE GROUND-STATE OXYGEN AVAILABLE. THE SINGLET OXYGEN REACTS WITH AN OXYGEN ACCEPTOR, THE DISAPPEARANCE OF WHICH CAN BE FOLLOWED BY SPECTROPHOTOMETRY. IN THE PHOTOSTATIONARY STATE, CHANGES IN ACCEPTOR ABSORBANCE ARE DIRECTLY RELATED TO THE OVERALL FLUX OF OXYGEN THROUGH THE MEMBRANE. THE PERMEATION COEFFICIENT OF OXYGEN IS PROPORTIONAL TO THE RATE OF CHANGE IN ACCEPTOR ABSORBANCE AND TO THE INVERSE OF THE OXYGEN CONCENTRATION IN THE SURROUNDING ATMOSPHERE. OXYGEN PERMEABILITY WAS MEASURED FOR A GROUP OF WATER-SOLUBLE POLYMERS. 13 REFS. 6M-93513T

INFLUENCE OF THE STRUCTURAL ISOMERISM OF A POLYMER ON THE PERMEABILITY DIFFUSION AND SOLUBILITY OF HELIUM, HYDROGEN, NEON AND ACETONE VAPOUR 79-10 36895L

TIKHOMIROV, B. P. POLYAK, M. A.

IZV.VUZ KH.I KH.TEKH.,22,NO.2,1979,P.211-4

RUSSIAN. A STUDY IS DESCRIBED OF THE PERMEABILITY OF POLYMETHYL ACRYLATE (PMA) TO HELIUM, HYDROGEN AND NEON, AND THE DIFFUSION AND SOLUBILITY COEFFICIENTS IN THE GLASS TRANSITION TEMPERATURE RANGE WERE DETERMINED. THE ACTIVATION ENERGY OF DIFFUSION OF ACETONE INTO PMA, AND THE COEFFICIENT OF DIFFUSION, ARE COMPARED WITH THOSE FOR PVAC, AND REASONS FOR THE DIFFERENCE ARE ADVANCED. 5 REFS. 42C35111-93513 ARTICLES FROM THIS JOURNAL CAN BE REQUESTED FOR TRANSLATION BY SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

GAS-PERMEABILITY OF POLYMERIC PACKAGING FILM
79-08 35301L

DODONOV, A. M.   MURAVIN, YA. G.

PLAST.MASSY,NO.12,1978,P.53

RUSSIAN. DATA ARE PRESENTED ON THE GAS PERMEABILITY OF PACKAGING MATERIALS, TOGETHER WITH A DESCRIPTION OF A DEVICE USED FOR TESTING THIS PROPERTY. 2 REFS. 6P11-93513 ARTICLES FROM THIS JOURNAL CAN BE REQUESTED FOR TRANSLATION BY SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

DIFFUSION OF GASES THROUGH POLYURETHANE BLOCK POLYMERS
79-08 35444L

MCBRIDE, J. S.   MASSARO, T. A.   COOPER, S. L.

J.APPL.POLYM.SCI.,23,NO.1,1ST JAN.1979,P.201-14

THE DIFFUSIVITIES OF SIMPLE GASES THROUGH A SERIES OF PU BLOCK COPOLYMERS OF DIFFERING AROMATIC URETHANE CONTENT AND TYPE OF SOFT SEGMENT WERE MEASURED USING A QUADRAPOLE MASS SPECTROMETER AS A DETECTING DEVICE. ALTHOUGH AN ARRHENIUS EXPRESSION GENERALLY DESCRIBED THE TEMP. DEPENDENCE OF DIFFUSION IN THIS SYSTEM, A DISCONTINUITY WAS OBSERVED IN THE ARRHENIUS PLOTS FOR SOME MATERIALS AND THE DISCONTINUITY WAS FOUND TO BE RELATED TO THE ONSET OF THE TG IN THE HARD DOMAINS. POLYESTER-URETHANES HAD LOWER ACTIVATION ENERGIES FOR DIFFUSION THAN POLYETHER-URETHANES OF SIMILAR HARD SEGMENT COMPOSITION. 36 REFS. 43C6-93512

DIFFUSION CELL FOR THE STUDY OF GAS TRANSFER THROUGH REINFORCED POLYMER MATERIALS   79-06 32784L

KAPANIN, V. V.   PRILIPOV, V. V.

POLYM.SCI.USSR,19,NO.5,1977,P.1345-8

A DIFFUSION CELL WAS DESIGNED TO EXAMINE GAS TRANSFER

THROUGH REINFORCED FILM MATERIALS OVER A WIDE RANGE OF TEMPERATURES. THE GAS PERMEABILITY OF RUBBERISED FABRICS OF TERYLENE, LAVSAN (PETP) AND COTTON WAS STUDIED IN THE TEMP RANGE 20-80C. IT WAS SHOWN THAT THE LOGARITHMIC DEPENDENCE OF PERMEABILITY ON INVERSE TEMP. IS NON-LINEAR. THE EFFECTIVE ACTIVATION ENERGY OF PERMEABILITY WAS DETERMINED FOR THE TEMP. RANGE OF 20-40C. 3 REFS. 628-93513T

BARRIER POLYMERS 79-06 32280C

SALAME, M. STEINGISER, S.

NEW YORK,APRIL 1976,P.18-28. CONFER. 012 PUBLCN. DETAILS-
ACS,CHEM.MARKET.& ECON.DIV.
HISTORICAL...CHEM.MARKET...SYMPOSIA

THE PERMEABILITY OF POLYMERS AS DETERMINED BY STRUCTURAL AND MORPHOLOGICAL PROPERTIES OF BOTH THE POLYMER MATRIX AND THE PERMEATING SPECIES IS DISCUSSED. THE CHARACTERISTICS OF HIGH BARRIER POLYMERS ARE RESISTANCE TO GAS FLOW (OF OXYGEN, CARBON DIOXIDE AND NITROGEN) LIQUID (WATER) FLOW, AND RESISTANCE TO ABSORPTION OF ORGANIC MOLECULES. THE CALCULATION AND USE OF PERMACHLOR VALUES IN PREDICTING PERMEABILITY AND THE BARRIER PROPERTIES AND APPLICATIONS OF HIGH BARRIER POLYMERS E.G. SAN ARE DESCRIBED. DETAILS OF OTHER POLYMERS ARE PRESENTED IN TABULAR FORM. 12 REFS. 6L-9351

APPARATUS FOR STUDYING THE GAS PERMEABILITY OF POLYMERS
79-02 28108L

SILONOV, YU. A. KOLESNIKOV, A. N.

PLAST.MASSY,NO.8,1978,P.67-8

RUSSIAN. A LABORATORY APPARATUS FOR TESTING THE GAS PERMEABILITY OF POLYMERIC MATERIALS UNDER VACUUM AND HIGH PRESSURE AT VARIOUS TEMPERATURES IS DESCRIBED. 2 REFS. 293513T ARTICLES FROM THIS JOURNAL CAN BE REQUESTED FOR TRANSLATION BY SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

DETERMINATION OF PERMEABILITY OF POLYMERIC MEMBRANES
78-12 24850L

TEPLYAKOVA, V. V.   EVSENKO, A. L.   NOVITSKII, E. G.
DURGAR'YAN, S. G.

PLAST.MASSY,NO.5,1978,P.49-51

RUSSIAN. METHODS ARE PRESENTED FOR DETERMINING THE GAS PERMEABILITY OF POLYMERIC MEMBRANES, INCLUDING INTEGRAL AND DIFFERENTIAL VARIANTS OF MEASUREMENT OF THE COEFFICIENTS OF PERMEABILITY AND DIFFUSION OF GASES IN POLYMERS, USING GAS CHROMATOGRAPHS OVER A WIDE RANGE OF TEMPERATURES, PRESSURES AND STREAMS OF PENETRANT. THE COEFFICIENTS OF PERMEABILITY AND DIFFUSION OF VARIOUS GASES IN POLYVINYLTRIMETHYLSILOXANE ARE GIVEN. 12 REFS. 6M-93513T ARTICLES FROM THIS JOURNAL CAN BE REQUESTED FOR TRANSLATION BY SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

NOVEL TECHNIQUE FOR MEASURING THE DIFFUSION CONSTANT OF OXYGEN IN POLYMER FILMS   79-01 26081L

MACCALLUM, J. R.   RUDKIN, A. L.

EUR.POLYM.J.,14,NO.9,1978,P.655-6

A SIMPLE TECHNIQUE IS DESCRIBED FOR THE MEASUREMENT OF THE DIFFUSION CONSTANT FOR OXYGEN IN POLYMERIC GLASSES, AND MEASURED VALUES FOR PS AND PMMA ARE REPORTED. MEASUREMENTS MAY BE MADE OVER A WIDE RANGE OF TEMPERATURES. 3 REFS. 93513T

CHARACTERISATION OF POROUS POLYMERIC MEMBRANES BY GAS PERMEABILITY   79-01 26459L

NOHMI, T.   MANABE, S.   KAMIDE, K.   KAWAI, T.

KOBUNSHI RONBUN.,35,NO.8,AUG.1978,P.509-16

JAPANESE. AN ATTEMPT WAS MADE TO ESTABLISH A METHOD FOR ESTIMATING THIRD AND FOURTH AVERAGE PORE RADII AND PORE SIZE

FREQUENCY DISTRIBUTION FROM EXPERIMENTAL DATA ON GAS PERMEABILITY COEFFICIENT OF POROUS MEMBRANES. 7 REFS. 6M-93513

INTRODUCTION OF PLASTICS IN BIOGAS 79-01 26881L

KALIA, A. K. SINGH, R. B.

POP.PLAST.,23,NO.4,APRIL 1978,P.52-5

THE FINDINGS ARE PRESENTED OF TESTS INTO THE SUITABILITY OF POLYMERS SUCH AS PVC, SYNTHETIC RUBBER AND NYLON FOR THE STORAGE AND TRANSPORTATION OF GAS DERIVED FROM DUNG AND OTHER ORGANIC WASTES. RIGID PVC SHEET WAS FOUND TO BE SUITABLE AS A GAS HOLDER, AND PVC/NYLON LAMINATED SHEET WORKED SATISFACTORILY FOR THE TRANSPORTATION OF THE GAS. 1 REF. 63AG

PROBLEM OF DETERMINATION OF THE CONCENTRATION DEPENDENCE OF THE COEFFICIENT OF ACETONE DIFFUSION IN POLYMERS 79-01 27117L

BELYAYEV, O. F. VOYEVODSKII, V. S. BEZRUKAVNIKOVA, L. M. MAIZELIS, B. A.

POLYM.SCI.USSR,18,NO.6,1976,P.1543-7

A STUDY WAS MADE OF LATEX FILMS BASED ON POLYISOPRENE, POLYCHLOROPRENE AND NITRILE RUBBERS TO DETERMINE THEIR PERMEABILITY TO ACETONE VAPOUR. DIFFUSION COEFFICIENTS WERE OBTAINED FOR DIFFERENT SOLVENT CONCENTRATIONS USING A PROPOSED METHOD FOR CALCULATING THE CONCENTRATION DEPENDENCE OF THE COEFFICIENTS. 8 REFS. 93513

METHOD OF MEASURING THE DIFFUSION AND SOLUBILITY OF GASES IN POLYMERS 79-01 27119L

SAPOZHNIKOV, D. N. SHLYAKHOV, R. A. TOCHIN, V. A.

PLAST.MASSY,NO.6,1978,P.68-70

RUSSIAN. 8 REFS. 93513T ARTICLES FROM THIS JOURNAL CAN BE REQUESTED FOR TRANSLATION BY SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

LIQUID POLYSULPHIDE POLYMERS 78-09 21549L

WILHELM, G.

ADHASION,22,NO.5,MAY 1978,P.156-60

GERMAN. THE AUTHOR REVIEWS CHEMICAL COMPOSITION AND PROPERTIES OF THE THIOKOL RANGE OF LIQUID POLYSULPHIDE POLYMERS. DIFFERENCES IN CROSSLINK DENSITY RESULT IN POLYMERS OF DIFFERENT VISCOSITY, BUT ALL CONTAIN MERCAPTO AND GROUPS WHICH PERMIT CURING BY ATMOSPHERIC OXIDATION OR BY OXIDATION BY MEANS OF METAL OXIDES OR ORGANIC PEROXIDES. CURE RATE CAN BE CONTROLLED CHEMICALLY BY MEANS OF ADDITIVES AND THE POLYMERS CAN BE USED TOGETHER WITH PHENOL-FORMALDEHYDE, POLYESTER OR EPOXY RESINS. TOXICOLOGICAL PROPERTIES, STRENGTH, ELECTRICAL PROPERTIES, GAS AND WATER PERMEABILITY, ADHESIVE PROPERTIES AND THERMAL AND SOLVENT STABILITY ARE DISCUSSED, AND A RANGE OF APPLICATIONS REVIEWED. 32 REFS. 43C52-8962

MECHANISM OF GAS PERMEATION THROUGH POROUS POLYMERIC MEMBRANES 78-09 20897L

NOHMI, T. MAKINO, H. MANABE, S. KAMIDE, K. KAWAI, T.

KOBUNSHI RONBUN.,35,NO.4,APRIL 1978,P.253-61

JAPANESE. THE EFFECTS OF PORE SIZE DISTRIBUTION AND THE CHEMICAL NATURE OF THE PERMEATING GAS ON THE PERMEABILITY COEFFICIENT WERE INVESTIGATED. GAS FLOW WAS FOUND TO

CONSIST OF A MIXTURE OF VISCOUS AND SLIP FLOW. THE DEPENDENCE OF THE PERMEABILITY COEFFICIENT OF INORGANIC GASES ON PORE SIZE DISTRIBUTION AND THE MEAN FREE PATH OF THE GAS AGREED WITH A PREVIOUSLY PROPOSED THEORETICAL EQUATION WHEREAS THOSE OF ORGANIC GASES WERE MUCH LARGER THAN THE THEORETICAL VALUES. IT WAS SUGGESTED THAT INTERACTION BETWEEN MEMBRANE AND GAS COULD BE THE CAUSE OF OBSERVED DIFFERENCES FOR ORGANIC GASES. 14 REFS. 6M-93513

PARYLENE POLYMERS. I. SYNTHESIS, PROPERTIES AND IMPORTANCE
78-08 20094L

BALDOUF, L.   HAMANN, C.   LIBERA, L.

PLASTE U.KAUT.,25,NO.2,FEB.1978,P.61-4

GERMAN. THE PREPARATION OF POLY-P-XYLYLENES (PARYLENES) IS DESCRIBED AND THEIR DEPOSITIONS AS FILMS ON COOLED SURFACES BY BI-RADICAL COMBINATION METHODS, VIA THE PYROLYSIS OF P-XYLENE AND DI-P-XYLENE DERIVATIVES IN LOW-PRESSURE SYSTEMS, IS DISCUSSED. EXTREMELY UNIFORM POLYMER COATINGS OF THICKNESS 80A TO 100 MICRONS CAN BE ACHIEVED ON METAL, GLASS, WOOD OR PAPER, THEIR PURITY, MOLECULAR WEIGHT AND TRANSPARANCY BEING DETERMINED BY THE NATURE OF THE STARTING MATERIALS AND DEPOSITION CONDITIONS. ELECTRICAL AND MECHANICAL PROPERTIES AND GAS PERMEABILITY ARE EXAMINED AND USE OF THE FILMS AS DIELECTRICS IS DISCUSSED. 60 REFS. 42W

GAS PERMEATION OF POLYMER BLENDS. V. COMPATIBILITY STUDIES OF POLY (VINYL CHLORIDE) /POLY-EPSILON-CAPROLACTONE BLENDS
78-08 19713L

SHUR, Y. J.   RANBY, B.

J.MACROMOL.SCI.B,14,NO.4,1977,P.565-72

THE TRANSPORT BEHAVIOUR OF OXYGEN AND NITROGEN AT 25C WAS STUDIED FOR PHYSICAL BLENDS OF PVC/PCL AND FOUR TYPES OF ETHYLENE-VINYL ACETATE AND ACRYLONITRILE-BUTADIENE COPOLYMERS. THE PVC/PCL BLENDS WERE SHOWN TO FORM A COMPATIBLE SYSTEM. IT WAS ALSO SHOWN THAT AT PCL CONTENTS OF LESS THAN 30 WT.%, A SEPARATE CRYSTALLISED PCL PHASE WAS FORMED. THE RESULTS ARE DISCUSSED IN TERMS OF COOPERATIVE

SEGMENTAL RELAXATION PROCESSES BETWEEN PVC AND PCL CHAINS. 14 REFS. 42C382-6125-93513

HIGH DENSITY POLYETHYLENE 78-06 16996L

ANON

MAT.PLAST.ELAST.,NO.1,JAN.1978,P.34-7

ITALIAN. CONSIDERATION IS GIVEN TO THE PRODUCTION OF HDPE WITH REFERENCE TO COMMONLY USED POLYMERISATION PROCESSES, AND TO THE PROPERTIES OF THIS MATERIAL, I.E. CHEMICAL PROPERTIES, GAS PERMEABILITY, MECHANICAL, ELECTRICAL AND THERMAL PROPERTIES. DETAILS ARE ALSO GIVEN OF COMPOUNDING INGREDIENTS, PROCESSING AND APPLICATIONS, AND PROPERTIES OF HDPE AND COMPARED WITH THOSE OF LDPE AND PP. A LIST OF HDPE TRADE MARKS AND MANUFACTURERS IS INCLUDED. 42C11

ESTIMATION OF POLYMER SOLUBILITY PARAMETERS BY GAS CHROMATOGRAPHY 78-07 18239L

DIPAOLA-BARANYI, G. GUILLET, J. E.

MACROMOLECULES,11,NO.1,JAN./FEB.1978,P.228-35

PARTIAL MOLAR HEATS OF MIXING, PARTIAL MOLAR FREE ENERGIES OF MIXING AND THE FLORY-HUGGINS CONSTANT WERE DETERMINED FOR A VARIETY OF HYDROCARBONS IN PS AND POLYMETHYL ACRYLATE BY GAS CHROMATOGRAPHY. SOLUBILITY COEFFICIENTS AT INFINITE DILUTION WERE CALCULATED FROM THE THERMODYNAMIC DATA AND COMPARED WITH THEORETICAL PREDICTIONS. 33 REFS. 42C21-9351

SOME ASPECTS OF PLASMA COPOLYMERISATION OF ACETYLENE WITH NITROGEN AND/OR WATER 78-06 16346L

YASUDA, H. T HIROTSU

J.POLYM.SCI.POLYM.CHEM.,15,NO.11,NOV.1977,P.2749-71

PLASMA POLYMERISATIONS OF MIXTURES OF ACETYLENE-NITROGEN, ACETYLENE-WATER AND ACETYLENE-NITROGEN-WATER WERE INVESTIGATED USING AN ELECTRODELESS GLOW DISCHARGE FROM A 13.5 MHZ RADIOFREQUENCY SOURCE. PROPERTIES OF PLASMA POLYMERS WERE EXAMINED AS FUNCTIONS OF MOLE RATIOS OF NITROGEN AND/OR WATER TO ACETYLENE. PROPERTIES INVESTIGATED INCLUDE INTERNAL STRESS, GAS PERMEABILITY AND SURFACE ENERGY. 24 REFS. 42F1A-7223

POLYMERISATION OF ORGANIC COMPOUNDS IN AN ELECTRODELESS GLOW DISCHARGE. IX 78-05 15701L

YASUDA, H. HIROTSU, T.

J.APPL.POLYM.SCI.,21,NO.11,NOV.1977,P.3167-77

PROPERTIES (FREE-RADICAL CONCENTRATION, GAS PERMEABILITIES, INTERNAL STRESS, AND CONTACT ANGLE OF WATER) OF PLASMA POLYMERS OF ACETYLENE AND OF ACRYLONITRILE WERE INVESTIGATED AS A FUNCTION OF FLOW RATE OF MONOMER. IT WAS FOUND THAT THE FLOW RATE HAS A STRONG INFLUENCE ON FREE-RADICAL CONCENTRATION, GAS PERMEABILITIES AND INTERNAL STRESS BUT LITTLE INFLUENCE ON THE CONTACT ANGLE OF WATER. THE DISCHARGE POWER HAS LITTLE EFFECT ON PROPERTIES WHEN FULL GLOW IS MAINTAINED. GAS PERMEABILITIES DECREASE WITH INCREASING CONCENTRATION OF FREE RADICALS. 11 REFS. (PT.VIII,IBID. P.3139-46) 42F1-7223

NOBLE GAS PERMEABILITY OF POLYMER FILMS AND COATINGS
78-03 12274L

HAMMON, H. G.   ERNST, K.   NEWTON, J. C.

J.APPL.POLYM.SCI.,21,NO.7,JULY 1977,P.1989-97

PERMEABILITIES OF NOBLE GASES, PARTICULARLY ARGON, KRYPTON AND XENON, WERE MEASURED THROUGH A NUMBER OF POLYMER FILMS AND COATINGS. EXTRAPOLATION OF THE LOG OF THE PERMEATION COEFFICIENT VERSUS THE SQUARE OF THE GAS MOLECULAR DIAMETER WAS USED TO ESTIMATE RANDOM PERMEABILITY. AN EQUATION IS PRESENTED FOR PREDICTING PERMEABILITY TO THESE NOBLE GASES AS A FUNCTION OF THE BASE POLYMER STRUCTURE OF THE COATING. 14 REFS. 625-93513

DETERMINATION OF DIFFUSION COEFFICIENTS IN POLYETHYLENE BY GAS CHROMATOGRAPHY   78-03 12526L

MILLEN, W.   HAWKES, S. J.

J.POLYM.SCI.POLYM.LETT.,15,NO.8,AUG.1977,P.463-5

AN EXPRESSION FOR CALCULATING THE STATIONARY PHASE MASS TRANSFER TERM FOR THE DIFFUSIVITY OF ORGANIC MOLECULES IN LIQUID POLYMERS IS DISCUSSED. REVISED VALUES OF DIFFUSION COEFFICIENTS FOR SEVERAL SOLUTES IN LDPE USING THIS EQUATION ARE TABULATED. 8 REFS. 42C11-9351

DIFFUSION CELL FOR STUDY OF GAS TRANSFER THROUGH WALLS OF POLYMER TUBES   78-02 11562L

KAPANIN, V. V.   PRILIPOV, V. V.

POLYM.SCI.USSR,18,NO.3,1976,P.820-3

THE DESIGN OF A DIFFUSION CELL FOR INVESTIGATING THE TRANSFER OF LOW MOLEC.WT. SUBSTANCES THROUGH POLYMER TUBE WALLS, USING A GAS CHROMATOGRAPH, IS DESCRIBED. USING LDPE TUBES, IT WAS SHOWN THAT PRESSURE HAD NO EFFECT ON THE PERMEABILITY FACTOR AND THAT THE TEMP. DEPENDENCE OF THE

PERMEABILITY FACTCR WAS SIMILAR TO THAT OF FILMS. 8 REFS.
293513T

BARRIER POLYMERS 78-01 11207L

SALAME, M. STEINGISER, S.

POLYM.PLAST.TECHNCL.ENGNG.,8,NO.2,1977,P.155-75

FACTORS AFFECTING POLYMER BARRIER PROPERTIES AND THE EFFECTS OF POLYMER PARAMETERS, TEMP. AND THICKNESS AND PERMEATING SPECIES ON POLYMER BARRIER PROPERTIES ARE DISCUSSED. THE PREDICTION OF PERMEABILITY, DEFINITION AND CLASSIFICATION OF HIGH BARRIER POLYMERS, TYPES AND PRCPERTIES OF HIGH BARRIER POLYMERS, DILUTE SOLUTION ABSORPTICN, BARRIER PROPERTIES OF NITRILE POLYMERS AND ACRYLONITRILE-STYRENE COPOLYMERS ARE ALSO CONSIDERED. 12 REFS. (ACS CENTENNIAL MEETING, NEW YORK CITY, APRIL 1976) 9351

ENGINEERING PROPERTIES AND PERFORMANCE OF HIGH ACRYLONITRILE/STYRENE POLYMER SYSTEMS 77-12 05484C

HALL, W. J. CHI, H. K.

CLEVELAND,OHIO,OCT.1976,P.1-5. CONFER.012 PUBLCN. DETAILS- SPE. HIGH PERFORMANCE PLASTICS. NATIONAL TECHNICAL CONFERENCE

HIGH ACRYLONITRILE-STYRENE COPOLYMER SYSTEMS, CONTAINING 60-70% ACRYLCNITRILE, ARE DISCUSSED WITH PARTICULAR REFERENCE TO SYNTHESIS, THERMAL STABILITY, MELT VISCOSITY, GENERAL PROPERTIES OF AN INJECTION MOULDED SPECIMEN, ORIENTED FILM AND SHEET PROPERTIES, MELT FLOW, CHEMICAL RESISTANCE UV RESISTANCE, OUTDOOR WEATHERING RESISTANCE AND PERMEABILITY TRANSFER OF GASES AND WATER VAPOUR. 8 REFS.
42C391C21-9

CHROMATOGRAPHIC DETERMINATION OF THE GAS PERMEABILITY OF FILMS 77-12 05404L

ARKHIPTSEV, N. E. SHISHIMAROV, A. A. MOCHALOVA, L. A.

PLAST.MASSY,NO.4,1977,P.73-4

RUSSIAN. THE METHOD PERMITS DETERMINATION OF THE PERMEABILITY OF POLYMERIC FILMS TO CARBON DIOXIDE, OXYGEN AND NITROGEN. 3 REFS. 93513T SELECTED TRANSLATIONS FROM THIS JOURNAL ARE AVAILABLE TO SUBSCRIBERS TO THE RAPRA PRODUCED INTERNATIONAL POLYMER SCIENCE AND TECHNOLOGY

STUDY OF POLYMERS BY INVERSE GAS CHROMATOGRAPHY 77-01 00297L

BRAUN, J. M. GUILLET, J. E.

ADV.POLYM.SCI.,NO.21,1976,P.107-45

GAS CHROMATOGRAPHY; REVIEW. 116 REFS. 91T

PERMEABILITY -STRUCTURE RELATIONSHIPS OF HIGH POLYMERS 77-01 00337C

SALAME, M.

COATINGS PLAST.PREPRINTS,36,NO.1,APR.1976,P.488-97.CONFER. PUBLCN. DETAILS- 1ST CHEMICAL CONGRESS ON N.AMERICAN CONTINENT,MEXICO CITY,DEC.1975

GAS PERMEABILITY; CHEMICAL STRUCTURE; LIQUID. 10 REFS. 9351

EFFECTS OF GASEOUS ENVIRONMENTS ON POLYMERS 77-03 01455L

BROWN, N.

MAT.SCI.ENGNG.,25,NO.1/2,SEPT./OCT.1976,P.87-91

THIS PAPER EXAMINES THE EFFECT OF GASES SUCH AS NITROGEN AND ARGON, ON CRAZING AND MECHANICAL PROPERTIES OF POLYMERS. 19 REFS. 93513

GAS PERMEATION OF POLYMER BLENDS. III. POLYVINYL CHLORIDE (PVC) / CHLORINATED POLYETHYLENE (CPE) 77-07 02524L

SHUR, Y. J. RANBY, B.

J.APPL.POLYM.SCI.,20,NO.11,NOV.1976,P.3105-19

RESULTS OF MEASUREMENTS OF TRANSPORT OF GASES (HELIUM, OXYGEN, NITROGEN AND CARBON DIOXIDE) THROUGH BLENDS OF PVC AND CPE ARE PRESENTED AND THE DATA RELATED TO THE COMPATIBILITY OF THE BLENDS. THE DIFFUSIVITY AND SOLUBILITY OF THE GASES ARE DISCUSSED ON THE BASIS OF THE FREE VOLUME CONCEPT. 38 REFS. 42C382-6125-93513

GAS PERMEATION OF POLYMER BLENDS. IV. POLYVINYL CHLORIDE (PVC) /ACRYLONITRILE-BUTADIENE-STYRENE (ABS) TERPOLYMER 77-07 02525L

SHUR, Y. J. RANBY, B.

J.APPL.POLYM.SCI.,20,NO.11,NOV.1976,P.3121-31

THE TRANSPORT BEHAVIOUR OF HELIUM, OXYGEN, NITROGEN AND CARBON DIOXIDE IN MEMBRANES OF PVC/ABS BLENDS WAS STUDIED AT 25C. 19 REFS. (PT.III,IBID,P.3105-19). 42C382-6125-93513

MODEL INCORPORATING REVERSIBLE IMMOBILISATION FOR SORPTION AND DIFFUSION IN GLASSY POLYMERS 7401-20800L

TSHUDY, J.A. VON@FRANKENBERG, C.

J.POLYM.SCI.,POLYM.PHYS.ED.,11,NO.10,OCT.1973,P.2027-37

A MODEL INCORPORATING REVERSIBLE, BIMOLECULAR IMMOBILISATION FOR DIFFUSION AND SORPTION IN GLASSY POLYMERS IS DEVELOPED. SORPTION IS CONSIDERED TO OCCUR BY TWO DISTINCT MECHANISMS: ORDINARY DIFFUSION-CONTROLLED SORPTION AND SORPTION RESULTING FROM THE IMMOBILISATION OF DIFFUSING GAS MOLECULES BY PREEXISTING SITES IN THE POLYMER. EXPRESSIONS ARE OBTAINED FOR EQUILIBRIUM SORPTION, TRANSIENT SORPTION, AND TIME LAG. THE EFFECTS OF KINETIC PARAMETERS OF THE MODEL ARE ILLUSTRATED AND DISCUSSED. 15 REFS. 93513

ABSORPTION KINETICS OF SOLVENT VAPOURS IN POLYMER FILMS 7408-25139L

GLOECKNER, G. LOHMANN, D.

PLASTE U.KAUT.,21,NO.5,MAY 1974,P.354-8 GERMAN.

SORPTION OF METHYLENE CHLORIDE AND ACETONE VAPOURS BY FILMS OF PS AND SAN WITH 37.6 AND 60.1 MOL % ACRYLONITRILE, WAS INVESTIGATED USING THE PRAGER AND LONG APPARATUS. THE REDUCED SORPTION CURVES FOR THE FIRST PRESSURE INTERVAL SHOW THE KNOWN CHARACTERISTIC OF ANOMALOUS SORPTION. ALL SORPTIONS OF METHYLENE CHLORIDE VAPOUR BY THE SAN FILMS CONTAINING 37.6% ACRYLONITRILE UP TO 60 MICRONS THICK GAVE THE SAME DIFFUSION COEFFICIENTS IN THE FIRST PRESSURE INTERVAL, BUT THE OTHER FILMS GAVE LOWER VALUES IN ALL PRESSURE INTERVALS. 49 REFS. 42C21-625-93513

EFFECT OF LIQUID PHASE CONTACT ON THE PERMEATION OF GASES THROUGH POLYMERIC FILM/LIQUID LAYER COMPOSITES
7409-25723L

TALWAR, R.

DISS.ABS.INT.,B,34,NO.10,APRIL 1974,P.4947

THE TRANSMISSION OF CARBON DIOXIDE THROUGH POLYETHYLENE/LIQUID (WATER AND SODIUM CHLORIDE) COMPOSITES WAS STUDIED IN ORDER TO DETERMINE HOW THE PRODUCT INFLUENCES GAS OR VAPOUR TRANSMISSION THROUGH PACKAGING MATERIALS. (THESIS, RUTGERS UNIVERSITY, THE STATE UNIVERSITY OF NEW JERSEY, 1973, PP.151, ORDER NO. 74-8824) 42C11-6P1-93513

SIMPLE RADIOACTIVE TRACER METHOD FOR STUDYING SORPTION AND DIFFUSION OF VAPOURS IN POLYMERS 7510-37548L

DYER, A. NEWNS, A.C.

EUR.POLYM.J.,11,NO.5/6,MAY/JUNE 1975,P.397-8

A SIMPLE RADIOACTIVE METHOD FOR THE STUDY OF ISOTOPIC DIFFUSION OF SMALL MOLECULES IN POLYMERS IS DESCRIBED AND THE RESULTS OF AN EXPERIMENT USING A CELLOPHANE SAMPLE ARE GIVEN. 4 REFS. 93513T

MASS-SPECTROMETRIC METHOD FOR INVESTIGATION OF GAS PERMEABILITY OF POLYMER FILMS 73-05 12536L

IVASHCHENKO, D. A. KROTOV, V. A. TALAKIN, O. G. FUKS, E. V.

VYS.SOED.,14A,NO.9,SEPT.1972,P.2109-12

RUSSIAN. THE METHOD, WHICH ALSO ALLOWS DIFFUSION AND SOLUBILITY CONSTANT MEASUREMENTS, WAS TESTED ON SILICONE RUBBER SAMPLES. SOLUBILITY COEFFICIENTS DETERMINED BY TWO OTHER METHODS AGREED WITH THE VALUE FROM THE MASS SPECTROMETRIC METHOD WITHIN THE LIMITS OF EXPERIMENTAL ERROR. 2 REFS. 45C-93513

DIFFUSIVE AND BULK FLOW TRANSPORT IN POLYMERS
73-06 13300L

YASUDA, H. PETERLIN, A.

J.APPL.POLYM.SCI.,17,NO.2,FEB.1973,P.433-42

THE TRANSPORT OF VARIOUS PERMEANTS (GAS, DISSOLVED GAS, LIQUID SOLVENT ANC SOLUTE) THROUGH POROUS AND HOMOGENEOUS (NON-POROUS) POLYMER MEMBRANES UNDER THE DRIVING FORCES OF PRESSURE GRACIENT AND CONCENTRATION GRADIENT IS DISCUSSED. IN THE ABSENCE OF A PRESSURE GRADIENT, THE TRANSPORT PROCESS MAY BE DESCRIBED AS DIFFUSION. IN THE PRESENCE OF A PRESSURE GRADIENT, THE TRANSPORT PROCESS MAY BE DIFFUSION AND/OR BULK FLOW, DEPENDING CN MEMBRANE STRUCTURE AND NATURE OF PERMEANT. 16 REFS. 6M-9351

STUD"ES OF DIFFUSION IN POLYMERS BY GAS CHROMATOGRAPHY
73-08 14644L

GRAY, D. G. GUILLET, J. E.

MACROMOLECULES,6,NO.2,MARCH/APRIL 1973,P.223-7

IN THIS PAPER THE FACTORS WHICH GOVERN PEAK SHAPE IN GAS CHROMATOGRAPHY ARE OUTLINED AND THEIR RELEVANCE TO DIFFUSION MEASUREMENTS ON PCLYMERIC SUBSTRATES IS INVESTIGATED. BY A SUITABLE CHOICE OF CONDITIONS THE VAN DEEMTER EQUATION ENABLES DIFFUSION COEFFICIENTS TO BE CALCULATED FROM THE VARIATION IN CHROMATOGRAPHIC PEAK WIDTH WITH CARRIER GAS FLOW RATE. THIS METHOD IS APPLICABLE TO SOME HYDROCARBON PENETRANTS IN A PE STATIONARY PHASE. 20 REFS. 93513

POLYMERS WITH HIGH GAS IMPERMEABILITY 73-10 16349L

PELLINO, E.

MAT.PLAST.ELAST.,39,NO.8,AUG.1973,P.623-6

ITALIAN. THE ARTICLE DEALS WITH THE USE OF PLASTICS MATERIALS AS A SUBSTITUTE FOR GLASS IN THE PACKAGING OF

CARBONATED DRINKS. THE BASIC REQUIREMENTS OF THE MATERIAL ARE CONSIDERED: IMPERMEABILITY TO CARBON DIOXIDE, OXYGEN AND WATER, MECHANICAL AND THERMAL PROPERTIES IN GENERAL, AND IMPACT RESISTANCE. CURRENT APPLICATIONS AND POSSIBLE DEVELOPMENTS ARE DISCUSSED, WITH EXAMPLES FROM EUROPE AND THE USA. THE RESPONSE OF THE GLASS INDUSTRY IN THE FACE OF COMPETITION FROM PLASTICS IS ALSO DISCUSSED. 10 REFS. 93513 6P21-93513

DIFFUSION TIME LAG IN HETEROGENEOUS POLYMER MEMBRANES 73-12 17060L

KEMP, D. R.

DISS.ABS.INT.,B,33,NO.7,JAN.1973,P.3056

THE DIFFUSION TIME LAG WAS STUDIED IN POLYMERIC MEMBRANES CONTAINING A DISPERSED SECOND PHASE WHICH IMMOBILISED PART OF THE DIFFUSING SUBSTANCE. EQUATIONS WERE DEVELOPED FOR PREDICTING THIS QUANTITY BY OBTAINING ASYMPTOTIC SOLUTIONS OF THE APPROPRIATE TRANSPORT EQUATIONS. A CLOSED-VOLUME, PRESSURE-GROWTH METHOD WAS USED TO COLLECT TIME LAG AND PERMEABILITY DATA FOR TRANSPORT OF CARBON DIOXIDE, METHANE, NITROGEN AND HELIUM THROUGH SILICONE RUBBER MEMBRANES CONTAINING VARIOUS AMOUNTS OF 5A MOLECULAR SIEVE CRYSTALS. SORPTION CHARACTERISTICS OF THE MEMBRANES FOR THE GASES WERE MEASURED GRAVIMETRICALLY. RESULTS SHOWED THAT THE TIME LAG WAS INCREASED BY UP TO TWO ORDERS OF MAGNITUDE BY DESPERSING RELATIVELY SMALL AMOUNTS OF MOLECULAR SIEVE IN THE POLYMER. (THESIS, UNIVERSITY OF TEXAS AT AUSTIN, 1972, PP.187, ORDER NO.73-466) 45C-6M-93513

SPECTROPHOTOMETRIC DETERMINATION OF AVERAGE CONCENTRATION OF SULPHUR DIOXIDE IN AIR BY PERMEATION THROUGH POLYMER MEMBRANES 73-12 17061L

REISZNER, K. D.

DISS.ABS.INT.,B,33,NO.8,FEB.1973,P.3523

A SIMPLE, LOW-COST METHOD FOR MEASUREMENT OF THE AVERAGE CONCENTRATION OF SULPHUR DIOXIDE IN AIR IS DESCRIBED. IT CONSISTS OF A SIMPLE SAMPLING PROCEDURE COUPLED WITH THE

WEST-GAEKE METHOD FOR SUBSEQUENT DETERMINATION OF THE TRAPPED SULPHUR DIOXIDE. ESSENTIALLY, A GLASS TUBE, STOPPERED AT ONE END, IS FILLED WITH A SOLUTION OF 1.0M SODIUM TETRACHLORCMERCURATE AND THE EXPOSED END COVERED WITH A SILICONE RUBBER MEMBRANE. WHEN THE TUBE IS EXPOSED TO AIR CONTAINING SULPHUR DIOXIDE, THE SULPHUR DIOXIDE PERMEATES THROUGH THE MEMBRANE AND IS ABSORBED BY THE SOLUTION. (THESIS, LOUISIANA STATE UNIVERSITY AND AGRICULTURAL AND MECHANICAL COLLEGE, 1972, PP.89, ORDER NO.73-2980)
45C-6M-93513

REACTION OF NITROGEN DIOXIDE WITH NYLON 66 73-12 17253L

JELLINEK, H. H. G. YOKOTA, R. ITOH, Y.

POLYM.J.(JAP.),4,NO.6,1973,P.601-6

CHAIN SCISSION OF NYLON 66 FILMS DUE TO EXPOSURE TO NITROGEN DIOXIDE AT A PRESSURE OF 0.5 MM.HG WAS STUDIED AS A FUNCTION OF TEMP., FILM THICKNESS AND POLYMERMORPHOLOGY. THE RATE OF RANDOM CHAIN SCISSION WAS VERY SENSITIVE TO CHANGES IN MORPHOLOGY CAUSED BY VARIATIONS IN SOLVENT COMPOSITION FOR FILM CASTING AND IN METHOD OF PREPARATION. DECREASE OF CHAIN SCISSION WITH FILM THICKNESS INDICATED THAT DIFFUSION OF NITROGEN DIOXIDE INTO NYLON 66 WAS RATE-DETERMINING. AMIDE LINKS IN THE CHAIN FOLDS OF THE POLYMER MOLECULES LOCATED IN THE INTERFACIAL REGION BETWEEN AMORPHOUS AND CRYSTALLINE POLYMER PORTIONS WERE THOUGHT TO BE PARTICULARLY SUSCEPTIBLE TO CHAIN SCISSION, DUE TO THEIR STRAIN ENERGY.
5 REFS. 43C313-93513

REACTIONS OF LINEAR POLYMERS WITH NITROGEN DIOXIDE AND SULPHUR DIOXIDE 73-12 17421L

JELLINEK, H. H. G.

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THE EFFECT OF NITROGEN DIOXIDE AND SULPHUR DIOXIDE ON LINEAR POLYMERS IN PRESENCE AND ABSENCE OF AIR, OZONE AND NEAR-UV IRRADIATION WAS STUDIED. BESIDES RANDOM CHAIN SCISSION AND CROSSLINKING, INCORPORATION OF RESPECTIVE GROUPS ALONG THE SIDES OF THE CHAINS WAS FOUND TO TAKE PLACE. LOW MOLEC. WT.

COMPOUNDS WERE ALSO EVOLVED. DEGRADATION WAS SENSITIVE TO THE MORPHOLOGY OF THE POLYMER AND ALSO TO THE PERCENTAGE OF CRYSTALLINITY, SIZE AND SIZE DISTRIBUTION OF CRYSTALLITES IN THE POLYMER FILMS. RANDOM CHAIN SCISSION IS DISCUSSED IN DETAIL. 13 REFS. (ACS, DIV. OF CELLULOSE, WOOD AND FIBER CHEMISTRY, SYMPOSIUM ON TEXTILE FINISHING CHEMISTRY, 164TH NATIONAL MEETING, NEW YORK, AUG./SEPT. 1972) 93513

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