

Title	Priority Number	Prio Date	Patent Number (WO;EP;US)
Producing isocyanates e.g. 1,4-tetramethylenediisocyanate, comprises converting corresponding amine with phosgene in gas phase and in presence of inert medium, where phosgene and amine are vaporized and overheated, and then mixed	EP 2009-155751	20090320	WO2010106131
Apparatus for separating monomers from a residue containing diisocyanate comprises providing a highly viscous and/or a non-brittle solid material, and removing the obtained mixture from the apparatus	DE 2005-10051399 DE 2005-10046816	20051025 20050929	WO 2007036479 A1 EP 1931625 A1 US 20080262263 A1
Preparation of sulfur-containing compounds, e.g. thiols, comprises reacting mixed gas stream comprising hydrogen sulfide with linear or branched olefins in presence of water and carbon dioxide at specified pressure	DE 2004-10060321 US 2005-000302614	20041215 20051214	US 20060128994 A1 US 7235697 B2 DE 102004060321 A1 EP 1671946 A1 EP 1671946 B1
Preparation of polyoxymethylene dimethyl ether, useful as diesel fuel additives, comprises feeding and reacting methylal and trioxane in the presence of an acidic catalyst in a reactor	DE 2004-10053839 DE 2004-10051814	20041104 20041025	WO 2006045506 A1 EP 1809590 A1 US 20070260094 A1
Stabilization of highly concentrated formaldehyde solutions having a CH ₂ O content of greater than 70 wt.% against solids precipitation comprises heating the solution and storage at temperature	DE 2003-1009286 DE 2003-1009286	20030304 20030504	WO 2004078691 A1 EP 1601639 A1 US 20060084827 A1 US 7273955 B2
Purifying isocyanates by distillation, useful as monomers for making polyurethanes, includes separate step for eliminating non-evaporatable residues	DE 2002-1060092 US 2005-539131	20021219 20050616	WO 2004056759 A1 EP 1575907 A1 US 20060135810 A1 EP 1717223 A2 EP 1575907 B1 US 20070015934 A1 US 7358388 B2 EP 1717223 A3
Aqueous formaldehyde solution used for production of plastics and fertilizers contains formaldehyde in form of monomeric formaldehyde, methylene glycol and polyoxymethylene glycols	DE 2002-1038248 DE 2001-1054187	20020821 20011105	WO 2003040075 A2 EP 1444189 A2 US 20050040359 A1 US 7193115 B2 EP 1444189 B1
Preparation of isocyanates by reacting two partial amounts of chlorine with carbon monoxide, reacting phosgene with primary amines, separating and purifying isocyanates and hydrogen chloride, and separating chlorine	DE 2002-1035476 US 2002-000227865	20020802 20020827	US 20040024244 A1 WO 2004014845 A1 EP 1529033 A1 US 6916953 B2 EP 1529033 B1
Production of metal formate-formic acid mixtures, useful as fertilizer and animal feed additives comprises reaction of a metal hydroxide with carbon monoxide in the presence of a catalyst in an aqueous solution	DE 2001-1054757 EP 2002-000024989	20011109 20021107	EP 1310172 A1 EP 1310172 B1 US 20030092939 A1
High-purity 'electronics-grade' aqueous hydroxyamine solutions are obtained efficiently and with reduced product losses by distillation of a base-containing solution in a packed plate-type column	DE 2001-1031787 DE 2004-10028821	20010704 20040615	WO 2003004409 A1 EP 1406832 A1 US 20040156774 A1 US 6942762 B2 EP 1406832 B1
Production of 4,4'-diaminoditolymethane comprises reaction of o-toluidine with formaldehyde in the presence of an acid catalyst whereby the ratio of acid catalyst to o-toluidine is 0.8-1.2.	DE 2001-1016316 EP 2002-021630	20010402 20020927	EP 1403241 A1
Apparatus, for production of toluylene diisocyanate and methylenediphenyl diisocyanate, comprises distillation column and/or container and rotating evaporator	DE 2000-1064196 WO 2002-EP01658 AU 2002-250959 EP 2002-719855 CN 2002-828041 DE 2002-503849 US 2004-503005 KR 2004-712539	20001222 20020215 20020215 20020215 20020215 20020215 20040729 20040813	WO 2003068359 A2 EP 1476234 A2 US 20050020848 A1 EP 1476234 B1 US 7544832 B2
Production of aromatic polyamine mixture comprising 4,4'-methylenedianiline and higher homologs involves reacting aniline with formaldehyde using split stream of formaldehyde	DE 2000-1031540 EP 2001-000114057	20000628 20010608	EP 1167343 A1 EP 1167343 B1
Hydrogenation of nitro compound to amine, using vertical reactor with internal circulation to prevent localized overheating and external circulation for recycle and product recovery.	DE 1999-1032821 DE 1998-1057409	19990714 19981212	WO 2000035852 A1 EP 1137623 A1 US 6350911 B1 EP 1137623 B1

Production of methylene-diphenylamine, useful for conversion into polyisocyanate, especially methylene-diphenyl-isocyanate	DE 1998-1004915 US 2004-843046	19980207 20040511	WO 1999040059 A1 EP 1053222 A1 US 6433219 B1 US 20020132953 A1 EP 1270544 A1 EP 1053222 B1 EP 1270544 B1 US 6831192 B2 US 20050014975 A1 US 7230130 B2
Highly-selective preparation of methylene di(phenylamine) useful for isocyanate production	DE 1998-1004916 EP 1998-000124266	19980207 19981218	EP 934922 A1 EP 934922 B1
High purity electronic grade hydroxylamine - produced using a column, the hydroxylamine vapour being drawn off through a side outlet in the column sump and condensed.	DE 1997-1025851 WO 1998-EP03714	19970618 19980618	WO 1998057886 A1 EP 989952 A1 US 6153799 A EP 989952 B1
	DE 1986-3603376	19860205	US4702803
Producing mononitro aromatic compounds and/or dinitro aromatic compounds, preferably mononitrobenzene, mononitrotoluene and dinitrotoluene, comprises adding hydrate melts of metal nitrate, as a nitriding medium	EP 2009-153699	20090226	WO 2010097453 A1
Producing isocyanate, useful to produce polyurethane, comprises hydrogenating amine-containing mixture in presence of copper containing catalyst and reacting the amine-containing mixture with phosgene to give isocyanate-containing mixture	EP 2008-169399	20081119	WO 2010057909 A1
Preparing isocyanate, preferably methylene diphenyl diisocyanate/polymeric methylene diphenyl diisocyanate, comprises reacting corresponding amines with phosgene in the liquid phase, optionally in the presence of an inert medium	EP 2008-161976	20080807	WO 2010015667 A1
Processing residues from isocyanate production comprises hydrolyzing the residues with water, feeding the reaction product to a mixer with heat transfer surface, separating amine and water from the discharge and separating water from amine	EP 2008-154471	20080414	WO 2009127591 A2 WO 2009127591 A3
Preparation of polyoxymethylene homopolymer or copolymer comprises homopolymerizing or copolymerizing trioxane starting from methanol	EP 2007-150113	20071219	WO 2009077415 A1 EP 2225296 A1
Preparing a crude trioxane, useful to prepare polyoxymethylene homo/copolymer, comprises trimerizing formaldehyde from formaldehyde solution in presence of acid catalyst and distillatively concentrating the trioxane of the mixture	EP 2007-150114	20071219	WO 2009077416 A1 EP 2234996 A1
Separating trioxane from an input stream containing formaldehyde and trioxane and water, comprises e.g. subjecting the input stream to three distillation steps and purifying the obtained streams to give purified trioxane	EP 2007-118103	20071009	WO 2009047109 A1 EP 2197870 A1
Preparing diisocyanate, comprises mixing phosgene stream with diamine stream, mixing reaction mixture comprising e.g. isocyanate with a liquid, reconditioning condensed isocyanate and separating hydrogen chloride and phosgene stream	EP 2007-116729	20070919	WO 2009037179 A1 EP 2200976 A1 US 20100217035 A1
Producing polyisocyanate comprises reacting amines with phosgene, separating hydrogen chloride, phosgene and solvent from reaction mixture, separating liquid mixture to liquid and gaseous phase and processing gas phase to polyisocyanate	EP 2007-115380	20070831	WO 2009027418 A1 EP 2197836 A1
Removing formic acid, comprises adding tertiary amine and/or imine to the mixture in a catalytic amount to form the salt with the entire amount of formic acid and removing the formic acid/amine salt in a liquid phase in distillation sump	EP 2007-115178	20070829	WO 2009027434 A2 WO 2009027434 A3
Preparing isocyanate comprises introducing amine and phosgene solution, through first and second inlets, respectively, into cylinder-shaped mixing chamber, reacting amine with phosgene and removing product via an outlet	EP 2007-113120	20070725	WO 2009013303 A1
Producing trioxane from trioxymethylene glycol dimethyl ether comprises reacting trioxymethylene glycol dimethyl ether in the presence of an acidic catalyst and subsequently processing the reaction mixture by distillation	EP 2007-105347	20070330	WO 2008119742 A1 EP 2142525 A1 US 20100130756 A1
Trioxane production from trioxymethylene glycol dimethyl ether involves reacting trioxymethylene glycol dimethyl ether in presence of acidic catalyst	EP 2007-105348	20070330	WO 2008119743 A1 EP 2142526 A1 US 20100145079 A1
Biuret groups containing polyisocyanates production for use in containing agent, single or multiple component polyurethane varnish, primings, and fillers, involves mixing cycloaliphatic di or polyisocyanate and cycloaliphatic diamine	EP 2007-103875	20070309	WO 2008110492 A1 EP 2132249 A1

Method for separating trioxane from inlet flow consisting of formaldehyde, trioxane and water, and for producing trioxane from aqueous formaldehyde solution, involves preparing inlet flow, which contains formaldehyde as main component	EP 2007-101198	20070125	WO 2008090169 A1 EP 2114544 A1 US 20100121081 A1
Producing diisocyanate comprises reacting corresponding diamines with phosgene in a reaction zone loaded with diamine- and a phosgene containing gas stream and in such a reaction condition where the reaction components are in gasiform	EP 2007-100644	20070117	WO 2008086922 A1 EP 2111392 A1 US 20100041915 A1
Methylpentane diisocyanate preparation for producing polyisocyanates or thermoplastic polyurethanes, involves converting butadiene with hydrocyanic acid to mixture of methylglutaric acid dinitrile and adipodinitrile	EP 2006-126687	20061220	WO 2008074645 A1
Fuel mixture useful in large diesel engines comprises diesel oil and polyoxymethylene dialkyl ethers	EP 2006-126667	20061220	WO 2008074704 A1 EP 2104726 A1
Production of isocyanate from amine and phosgene, for use in polyurethane production, involves gas-phase reaction followed by transfer via an expanded section to a zone with sprayed quench liquid	EP 2006-123629	20061107	WO 2008055899 A1 EP 2079684 A1 US 20100076218 A1
Isocyanate preparation by gas-phase phosgenation of amine, includes rapid cooling of reaction gases in zone supplied with quenching liquid in curtain or closed chamber spray pattern	EP 2006-123621	20061107	WO 2008055904 A1 EP 2079685 A1 US 20100056822 A1
Production of isocyanate, e.g. diaminodiphenylmethane for use in polyurethane production, involves reacting phosgene with amine in at least two mixing chambers in parallel	EP 2006-123015	20061026	WO 2008049783 A1 EP 2084128 A1
Isocyanate production, for use as polyurethane intermediate, by cracking urethane economically produced using synthesis gas as starting material for carbonylation component	EP 2006-120495	20060912	WO 2008031755 A1
Production of isocyanate for use e.g. in polyurethane production, involves reaction of amine with urea and alcohol to form urethane and ammonia, cleavage of urethane and utilisation of liberated ammonia	EP 2006-119906	20060831	WO 2008025659 A1 EP 2069292 A1 US 20090275775 A1
Preparation of pentamethylene-1,5-diisocyanate, useful to prepare polyisocyanate or thermoplastic polyurethane, comprises converting lysine to 1,5-pentanediamine, and converting the 1,5-pentanediamine to pentamethylene-1,5-diisocyanate	EP 2006-118256	20060801	WO 2008015134 A1 EP 2049675 A1 US 20090292100 A1
Production of isocyanate, useful as basic material for producing polyurethane, comprises mixing amines, or a mixture of amines and a solvent in the form of aerosol with gaseous phosgene and subsequently reacting the amine with phosgene	EP 2006-117172	20060713	WO 2008006775 A1 EP 2044009 A1 US 20090281350 A1
Preparing trioxane from formaldehyde comprises introducing a feed stream and reflux stream into a formaldehyde unit, and introducing a product stream, a reflux stream and a formaldehyde-rich stream into a low-pressure distillation column	EP 2006-115287	20060612	WO 2007144320 A1 EP 2032553 A1 US 20090187033 A1 EP 2032553 B1
Preparation of isocyanate, useful in the preparation of e.g. urethane, isocyanurate, amide and/or urea, comprises reacting di- or polyamine with urea to give di- or polyurea and splitting of di- or polyurea to the corresponding isocyanate	EP 2006-100315	20060113	WO 2007082818 A1 EP 1976825 A1
Preparation of liquid fluorosulfonic acid, useful e.g. as a strong protonating- and fluorinating agent, comprises reacting sulfur trioxide and hydrogen fluoride in a distillation column	DE 2005-10061316	20051220	WO 2007071579 A1
Preparing trioxane and comonomer, useful for preparing trioxane based (co)polymer, comprises converting formaldehyde and comonomer educt to trioxane and co-monomer, and distilling the obtained reaction mixtures	DE 2005-10051974	20051031	WO 2007051762 A1 EP 1945689 A1 US 20080283384 A1
Preparation of isocyanate comprises reacting amine with urea and an alcohol to give corresponding urethane in a mixer, which is connected with retention time reactor and subsequently splitting of urethane gives corresponding isocyanate	DE 2005-10043799	20050913	WO 2007031444 A1 EP 1926707 A1 US 20080249332 A1
Production of dioxolane by reaction of ethylene glycol with formaldehyde in an aqueous solution in the presence of catalysts, comprises supplying educts ethylene glycol and aqueous formaldehyde solution to a reactive distillation column	DE 2005-10042505	20050907	WO 2007028809 A1 EP 1931650 A1 US 20080255376 A1 US 7754900 B2
Preparation of an isocyanate comprises reaction of the corresponding amines with phosgene, optionally in the presence of an inert medium, in the gas phase and in the amine steam reactor with phosgene streams	DE 2005-10042392	20050906	WO 2007028715 A1 EP 1924552 A1 US 20090221846 A1
Integrated production of trioxane from formaldehyde, comprises supplying stream and reconducting stream, respectively containing water and formaldehyde to trioxane-synthesis reactor and supplying obtained streams to distillation columns	DE 2005-10037294	20050808	WO 2007017410 A1 EP 1915358 A1 US 20080281109 A1 EP 1915358 B1

Integrated production of trioxane from formaldehyde, comprises supplying stream and reconducting stream, respectively containing water and formaldehyde to trioxane-synthesis reactor and supplying the obtained streams to distillation column	DE 2005-10037293	20050808	WO 2007017479 A1 EP 1915359 A1 US 20100152466 A1
Diisocyanates production by supplying gas flow containing diamine and phosgene to reaction zone, separating surplus phosgene and hydrogen chloride gas from gaseous reaction mixture, and feeding back the separated phosgene into the reaction	DE 2005-10037328	20050804	WO 2007014936 A2 EP 1912934 A2 US 20080200722 A1
Integrated procedure for production of trioxane from formaldehyde, comprises feeding a stream and a recycle stream containing water and formaldehyde to the oxane synthesis reactor to obtain a product stream	DE 2005-10036544	20050803	WO 2007014853 A1 EP 1912965 A1 US 20080194845 A1
Use of polyoxymethylene dialkyl ethers as additives for increasing the cetane number of diesel fuel blends containing biodiesel	DE 2005-10030282	20050629	WO 2007000428 A1 EP 1899438 A1 US 20080216390 A1
Preparation of polyoxymethylene dialkylethers, used as diesel fuel additives, comprises feeding dialkylether e.g. dimethylether, methylethylether or diethylether and trioxane into a reactor and reacting in the presence of an acid catalyst	DE 2005-10027690	20050615	WO 2006134081 A1 DE 102005027690 A1 EP 1902009 A1 US 20080207955 A1 EP 1902009 B1
Preparing trioxymethylene glycol dimethylether and tetraoxymethylene glycol dimethylether comprises distilling an aqueous formaldehyde solution and methanol and distilling the required fractions successively	DE 2005-10027701	20050615	WO 2006134088 A1 EP 1893660 A1 US 20080207954 A1 US 7671240 B2 EP 1893660 B1
Processing of isocyanate adduct, comprises reacting isocyanate adduct with pure ammonia, processing the obtained product and reducing the formed amine into the isocyanate production	DE 2005-10027814	20050615	WO 2006134137 A1 EP 1893564 A1 EP 1893564 B1 US 20100227997 A1
Preparing tri-/tetra oxymethylene glycol dimethylether comprises distilling an aqueous formaldehyde solution and methanol, distilling the required fractions successively to form organic phase, and distilling the organic phase	DE 2005-10027702	20050615	WO 2007051658 A1 EP 1893667 A1 US 20080221368 A1 EP 1893667 B1 US 7700809 B2
Preparation of isocyanate comprises preparing a raw-methylene diphenylamine mixture; transferring the mixture in to a gaseous phase; and phosgenizing the raw-methylene diphenylamine in the gaseous phase	DE 2005-10014847	20050330	WO 2006103188 A1 EP 1866281 A1 US 20080171894 A1
Preparation of isocyanate comprises preparing raw methylene diphenylamine mixture; separating the raw-mixtures; and phosgenizing the obtained monomer methylene diphenylamine and polymethylene diphenylamine	DE 2005-10014846	20050330	WO 2006103189 A1 EP 1866282 A1 US 20080200721 A1
Chlorine production from hydrogen chloride, comprises feeding hydrogen chloride containing stream, feeding, cooling and drying product gas stream, liquefying the gas stream and separating gas/liquid stream and aqueous hydrochloric acid	DE 2005-10008612	20050223	WO 2006089877 A1 EP 1866239 A1 US 20080159948 A1
Preparation of alkyl thiol, useful as odoriferous substances, components in lubricants and intermediate in radical polymerization, comprises adding hydrogen sulfide at the double bonds of olefin in presence of organic liquid acid	DE 2004-10060320	20041215	EP 1674453 A1 US 20060173218 A1
Preparation of raw trioxane comprises acid catalyzed reaction of highly concentrated aqueous formaldehyde solution to give trioxane/formaldehyde/water mixture followed by distillation of mixture	DE 2004-10058707	20041206	WO 2006061167 A1
Production of polyisocyanate for use in making polyurethane, involves reacting the corresponding polyamine with phosgene in a solvent which forms a salt melt with hydrogen chloride, e.g. dioxan or a glycol ether	DE 2004-10053661	20041103	WO 2006048141 A1 EP 1812380 A1 US 20090112018 A1
Production of polyisocyanate for use in making polyurethane, involves reacting a primary amine with phosgene in presence of an ionic liquid as solvent, e.g. 1-butyl-3-methyl-imidazolium chloride	DE 2004-10053662	20041103	WO 2006048171 A1 EP 1812382 A1
Preparation of polyisocyanate, useful as basic materials for the production of polyurethane, comprises reaction of primary amines with phosgene in the presence of an ionic liquid solvent	DE 2004-10053662	20041103	WO 2006048171 A1 US 20090112017 A1
Preparation of trioxane comprises acidic catalyst reacting concentrated aqueous formaldehyde solution in reactor, distilling the formed trioxane/formaldehyde/water mixture and distillative processing the formed raw-trioxane	DE 2004-10051118	20041020	WO 2006042759 A1 EP 1805162 A1 US 20070293689 A1 EP 1805162 B1

Liquid ring compressor, to compress gas or act as a vacuum pump, has an impeller in an eccentric mounting within the compressor housing using an ionic fluid to form the liquid ring	DE 2004-10045173	20040917	WO 2006029884 A1 EP 1794458 A1 US 20070269309 A1
Separation of hydrogen chloride and phosgene involves extraction of the hydrogen chloride using an ionic fluid, especially ethyl-3-methylimidazolium chloride	DE 2004-10044592	20040913	WO 2006029788 A1 EP 1789160 A1 US 20070293707 A1 EP 1789160 B1
Production of pure trioxane, by distillation, has a separation column with a dividing wall to take a feed mixture of trioxane with formaldehyde and water	DE 2004-10040284	20040819	WO 2006018302 A1 EP 1781634 A1 US 20070293688 A1
Producing isocyanates comprises reacting amines with phosgene that is substantially isocyanate-free and has a low hydrogen chloride content	DE 2004-10026095	20040525	WO 2005115974 A1 EP 1753715 A1 US 20070232827 A1
Exothermal chemical reactions reaching equilibria are performed in fluidized bed catalytic reactor, with efficient cooling to maintain low post reaction temperature	DE 2004-10014677	20040325	WO 2005092488 A1 EP 1735084 A1 US 20070202035 A1
Reactor for producing chlorine by gas-phase oxidation of hydrogen chloride in a fluidized bed of catalyst comprises gas-permeable plates in thermal communication with a heat exchanger	DE 2004-10006610	20040211	WO 2005077520 A1 EP 1715946 A1 US 20070183963 A1 US 7736598 B2
Production of highly concentrated formaldehyde solution for use in various chemical reactions, involves preheating dilute solution, depressurising to form a two-phase mixture and concentrating this in a spiral-coil evaporator	DE 2004-10006649	20040211	WO 2005077877 A1 EP 1723094 A1 US 20070135660 A1 US 7342139 B2
Distilling tolylenediamine from a feed stream containing heavy and light boilers comprises using a partitioned column	DE 2004-10001456	20040108	WO 2005066113 A1 EP 1706370 A1 US 20070083065 A1 EP 1706370 B1 US 7342134 B2
Separation of trioxane from mixtures also containing water and formaldehyde, useful as part of a trioxane production process, includes three distillations at different pressures to avoid formation of ternary azeotrope	DE 2003-1061518	20031223	WO 2005063353 A1 EP 1699537 A1 US 20070155972 A1 EP 1699537 B1
Preparation of formaldehyde by vapor-phase oxidation of methanol over fixed bed of catalyst, is done in a reactor that includes thermal plates, for circulation of coolant, spaced part along the reactor	DE 2003-1061517	20031223	WO 2005063375 A1 EP 1699551 A1 US 20070142677 A1 US 7381851 B2
Producing chlorine by gas-phase oxidation of hydrogen chloride with an oxygen-containing gas comprises using a reactor comprising longitudinal cavity plates separated by gaps containing catalyst	DE 2003-1061519	20031223	WO 2005063616 A1 EP 1699734 A1 US 20080233043 A1
Separating trioxane from a stream also containing formaldehyde and water, useful as part of a trioxane production process, includes three distillations at different pressures to avoid formation of ternary azeotrope	DE 2003-1061516	20031223	WO 2005063733 A1 EP 1699776 A1 US 20070272540 A1 EP 1699776 B1 US 7713387 B2
Producing chlorine comprises catalytic gas-phase oxidation of hydrogen chloride with oxygen in two stages using a fluidized bed in the first stage and a fixed bed in the second stage	DE 2003-1036522	20030808	WO 2005014470 A1 EP 1656322 A1 US 20060263290 A1 EP 1656322 B1
Production of diaminodiarylmethane, for use as a source of di-isocyanate and polyurethane, involves reacting aryl-amine with a methylene source using homogeneous acid catalyst and removing catalyst with basic ion exchange resin	DE 2003-1031772	20030711	WO 2005007613 A1 EP 1646604 A1 US 20070010692 A1 EP 1646604 B1 US 7408083 B2
Starting materials for polyurethane production are obtained by conversion of hydroxy group-containing formaldehyde oligomers, especially using alkylene oxides or isocyanates	DE 2003-1019242	20030428	WO 2004096746 A1 EP 1620383 A1 US 7705106 B2
Production of polyisocyanates useful for polyurethane production comprises reacting an amine with phosgene in a tubular reactor and passing the reactor effluent to a distillation column	DE 2003-1010888	20030311	WO 2004080587 A1 EP 1601456 A1 EP 1601456 B1 US 20060223966 A1

Separating liquid containing volatile and involatile components, e.g. to remove methanol from aqueous formaldehyde solution, involves using a film evaporator with an internal coating which catalyses the formation of volatiles	DE 2003-1009392	20030304	WO 2004078307 A1 EP 1601435 A1 EP 1688168 A1 EP 1704905 A1 EP 1601435 B1 US 20070106096 A1 US 7414159 B2 EP 1704905 B1 EP 1688168 B1
Production of highly concentrated formaldehyde solutions having a CH ₂ O content of at least 50 wt.% by partial evaporation such that water is concentrated in the gas phase and removed under defined conditions of temperature	DE 2003-1009289	20030304	WO 2004078678 A2 EP 1606241 A2 EP 1606241 B1 US 20060211841 A1 US 7345207 B2
Production of highly concentrated gaseous formaldehyde from an aqueous formaldehyde solution comprises evaporation with removal of the resulting gas phase under defined conditions of temperature	DE 2003-1009288	20030304	WO 2004078690 A1 EP 1606240 A1 US 20060185513 A1 US 7390932 B2
Production of isocyanates by reacting amines with phosgene comprises using phosgene with a high hydrogen chloride content	DE 2002-1061187	20021220	WO 2004058689 A1 EP 1587785 A1 US 20060116529 A1
Preparation of polyisocyanates, useful in preparation of polyurethanes, by reacting amine and phosgene in three stages, at progressively lower pressures	DE 2002-1060082	20021219	WO 2004056756 A1 EP 1575904 A1 US 20060252960 A1 EP 1575904 B1
Preparation of isocyanates from amines and phosgene, useful as monomers for polyurethane, with separation and purification of product in a counterflow distillation column	DE 2002-1060093	20021219	WO 2004056757 A1 EP 1575905 A1 EP 1575905 B1 US 20060089507 A1
Partial or complete separation of mixture of hydrogen chloride and phosgene, used in vinyl chloride manufacture or Deacon process and in isocyanate synthesis, involves condensing and stripping <u>phosgene and scrubbing gas stream</u>	DE 2002-1060084	20021219	WO 2004056758 A1 EP 1575906 A1 US 20060123842 A1 US 7584629 B2
Continuous preparation of aliphatic or cycloaliphatic diisocyanates, useful in preparation of polyurethanes and paint, by mixing diamine with phosgene and reacting in series of reactors	DE 2002-1060094	20021219	WO 2004056760 A1
Production of isocyanates, especially useful for polyurethane production, by reacting amines with phosgene in an organic solvent comprises solvent recovery by two-stage distillation with heat exchange	DE 2002-1060027	20021219	WO 2004056761 A1 EP 1575908 A1 US 20060011463 A1 EP 1575908 B1 EP 1575908 B2 US 7524405 B2
Preparation of chlorine by gas-phase oxidation of hydrogen chloride by a gas stream having molecular oxygen in presence of a fixed-bed catalyst is carried out in reactor having bundle of parallel catalyst tubes and deflector plate	DE 2002-1058153	20021212	US 20040115118 A1 WO 2004052776 A1 EP 1572582 A1 EP 1572582 B1
Preparation of chlorine involves oxidation of hydrogen chloride and gas stream comprising molecular oxygen in presence of fixed-bed catalyst is carried out in reactor having annular and disk-shaped <u>deflection plates between catalyst tubes</u>	DE 2002-1058180	20021212	US 20040115119 A1 WO 2004052777 A1 EP 1581457 A1
Production of chlorine comprises catalytic oxidation of hydrogen chloride produced by distilling a mixture of fresh and recycled hydrochloric acid	DE 2002-1050131	20021028	WO 2004037718 A2 EP 1558521 A2 US 20060099138 A1 EP 1558521 B1
Production of isocyanates by reaction of a suspension comprising a primary amine with phosgene, comprises processing of a suspension of solid carbamyl chloride in liquid isocyanate in a film evaporator	DE 2002-1045584	20020927	WO 2004031132 A1 EP 1546091 A1 US 20060052629 A1 US 7592479 B2
Catalyst for catalytic oxidation of hydrogen chloride, useful in chlorine production by Deacon process, comprises gold and optionally other metal(s) on support	DE 2002-1044996	20020926	WO 2004031074 A1 EP 1546032 A1 US 20060140849 A1
Production of chlorine by fixed bed catalytic gas-phase oxidation of hydrogen chloride, comprises removing a recycle stream from the product gas and recycling it to the reaction zone	DE 2002-1042400	20020912	US 20040052718 A1 WO 2004026761 A1 EP 1542923 A1 US 6962682 B2 EP 1542923 B1
Production of aromatic di-isocyanate e.g. used in polyurethane production, comprises gas-phase reaction of phosgene with diamine under moderate pressure in reactor with low phosgene hold-up	DE 2002-1038995	20020820	WO 2004026813 A1 EP 1532107 A1 US 20050272910 A1

Continuous production of isocyanate by phosgenation of primary amine involves using reactor cascade in which volume of first reactor is less than average volume and only liquid phase is passed to next reactor	DE 2002-1022968	20020523	WO 2003099770 A1 EP 1509496 A1 US 20050222453 A1 US 7112694 B2 EP 1509496 B1
Production of trioxane comprises distillation of the crude trioxane; crystallization of the trioxane and; separation from the mother liquor followed by melting and distillation of other byproducts	DE 2002-1022163	20020517	WO 2003097630 A1 EP 1509512 A1 US 20050176973 A1 EP 1509512 B1
Continuous production of chlorine by oxidizing hydrogen chloride with oxygen over heterogeneous catalyst uses limited conversion per pass	DE 2002-1021802	20020515	WO 2003097525 A1 EP 1506133 A1 US 20050175528 A1
Production of isocyanates from urethanes comprises cleavage of mono- or multifunctional urethane whereby partial stream of recovered alcohol is used as cooling and condensation agent	DE 2002-1009095	20020301	WO 2003074477 A1 EP 1483235 A1 US 20050154227 A1 US 7179935 B2 EP 1483235 B1
Production of oxymethylene (co)polymers useful as technical plastics comprises separating water and formaldehyde from a polyoxymethylene glycol solution and contacting the product with a polycondensation catalyst	DE 2001-1058813	20011130	WO 2003046035 A1
Production of isocyanate involves gas-phase reaction of prim. amine with phosgene in a reactor channel with an internal width which is at least twice the height	DE 2001-1058160	20011128	WO 2003045900 A1 EP 1451150 A1 US 20050070734 A1 US 7084297 B2 EP 1451150 B1
Production of high purity aqueous hydroxylamine solution, used in the electronics industry in cleaning platinum or silicon wafers, involves distillation in a plate-type column with packing or fillers above at least one plate	DE 2001-1031788	20010704	WO 2003004407 A1 EP 1406833 A1 US 20040149564 A1 EP 1406833 B1 US 7029557 B2
Production of salt-free aqueous hydroxylamine solution, used in the electronics industry in cleaning platinum or silicon wafers, involves distillation of a mixture of aqueous hydroxylammonium salt with sodium/potassium hydroxide mixture	DE 2001-1034389	20010704	WO 2003004408 A1 EP 1409401 A1 US 20040149563 A1 EP 1409401 B1 US 7105078 B2
Isocyanate production by reacting primary amines with phosgene in an isocyanate solvent, comprises adding at least part of the solvent after combining the amine and phosgene	DE 2001-1029233	20010619	WO 2002102763 A1 EP 1401802 A1 US 20040192959 A1 US 6833469 B2 EP 1401802 B1
Distillation column for mixtures, with toxic component, has packing with variable inner geometry to form lower bubbling layer with dispersed gas phase and an upper film layer with a continuous gas phase	DE 2001-1024386	20010518	WO 2002094432 A1 EP 1399252 A1 US 20040150123 A1 US 7431804 B2
Producing alkanesulfonyl chlorides and alkanesulfonic acids, used in synthesis, for e.g. of plant protection agent, or as acid, solvent or catalyst, involves reacting dialkyl disulfide and water with countercurrent chlorine stream in column	DE 2000-1037507	20000801	WO 2002010123 A1
New alkoxy- and hydroxy-substituted N,N,N-tri((het)aryl-(hetero)alk(en)yl), (het)aryl-(hetero)alkynyl and (het)aryl-(hetero)cycloalk(en)yl)-amines and salts are used for stabilizing hydroxylamine solution	DE 2000-1008080	20000222	WO 2001062710 A1 EP 1257525 A1 US 20030026751 A1 US 6758990 B2 EP 1257525 B1
Reacting solutions of equilibrium mixtures with other reactants, including separation of desired reactant from mixture to increase selectivity, especially applied to reactions using aqueous formaldehyde.	DE 1999-1025870	19990607	EP 1063221 A1 US 6610888 B1 EP 1063221 B1
Work-up of distillation residuals from toluylene diisocyanate preparation	DE 1998-1027086	19980618	WO 1999065868 A1 EP 1086075 A1 EP 1086075 B1 US 6673960 B1
Production of diphenylmethanediisocyanate and polyphenylene-polymethylene-polyisocyanate mixtures	DE 1998-1017691	19980421	WO 1999054289 A1 EP 1073628 A1 EP 1073628 B1 US 6576788 B1
Production of aqueous solution of free hydroxylamine - involves treating hydroxyl ammonium salt solution counter-currently with ammonia (water) and separating into fractions, without using combustible materials.	DE 1997-1033681	19970804	WO 1999007637 A1 EP 1012114 A1 EP 1012114 B1

Prod. of pyrazole cpds. - by electrochemical oxidn. of 2-pyrazoline cpds., for use in dyes, pharmaceuticals etc.	EP 1987-101734	19870209	EP 237762 A EP 237762 B
Lower alkyl formate prepn. from alkanol and carbon mon:oxide - with addn. of alkyl formate to reaction mixt.	DE 1986-3621362	19860626	EP 251112 A
Prod. of 1-pyrazoline cpds. - by oxidn. of 1,3-di:amino-propane cpds. with hypochlorite and hydro:peroxide	DE 1985-3525268	19850716	EP 210470 A US 4788293 A EP 210470 B1
Pyrazole derivs. prodn. by oxidn. of 2-pyrazoline derivs. - using peroxy cpds. pref. hydrogen peroxide as oxidising agents	DE 1984-3415385	19840425	EP 162247 A EP 162247 B