

## CATALYSIS

### Linear olefin skeletal isomerization process using ZSM-35 catalysts

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PCT Int. Appl. 94,08,920, Apr. 28, 1994; U.S. Appl. Oct. 16, 1992

Linear C<sub>4-10</sub> olefins (e.g., 1-butene, 1-pentene, etc.) are isomerized with ZSM-35 zeolite catalysts (preferably microcrystalline ZSM-35 having its largest crystal dimension  $\leq 0.5 \mu$ ) under isomerization conditions to produce iso-olefins of the same carbon number (e.g., isobutene, isopentene, etc.).

### Synthesis of alkyl tertiary alkyl ethers using $\beta$ -zeolite catalysts

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Texaco Chemical Co.

Eur. Pat. Appl. 595,567, May 4, 1994; U.S. Appl. Oct. 28, 1992

A process is shown for the preparation of alkyl tertiary-alkyl ether from tertiary-alkyl alcohol and primary alcohol in the presence of a catalyst, characterized in that the catalyst is a  $\beta$ -zeolite or a  $\beta$ -zeolite modified with one or more metals selected from groups IB, VB, VIB, VIIB, or VIII of the Periodic Table.

### Catalyzed decomposition of organic hydroperoxides

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PCT Int. Appl. 94,08,932, Apr. 28, 1994; NL Appl. Oct. 9, 1992

In the catalyzed decomposition of organic hydroperoxides (e.g., cyclohexylhydroperoxide to cyclohexanol and cyclohexanone), a heterogeneous catalyst, which is composed of a three-dimensional microporous structure (e.g., molecular sieves, zeolites, etc.) containing Al, Si, and/or P oxides and a metal catalyst incorporated into the lattice, has little loss in activity, and little metal waste is observed.

### Preparation of dihydric phenols

O. Kondo; T. Sugai; S. Yoshida  
Mitsubishi Gas Chemical Co.

Jpn. Kokai Tokkyo Koho 94,40,977, Feb. 15, 1994; Appl. Jul. 22, 1992

The title compounds are prepared by treating phenols with H<sub>2</sub>O<sub>2</sub> in the presence of crystalline aluminotitanosilicates and cyclic ethers.

### Fluid catalytic cracking process for producing light olefins

P.E. Eberly, Jr.; W.E. Winter, Jr.  
Exxon Research and Engineering Co.

Eur. Pat. Appl. 600,686, Jun. 8, 1994; U.S. Appl. Nov. 30, 1992

A fluid catalytic cracking process for producing light olefins and low emissions fuel products is presented. The feedstock is relatively low in nitrogen and relatively high in hydrogen content. The catalyst contains a mixture of zeolite-Y and ZSM-5.

### Removing nitrogen oxides from oxygen-rich exhaust gas

S. Kasahara; S. Inoue; K. Sekitani et al.  
Tosoh Corp.

Eur. Pat. Appl. 600,483, Jun. 8, 1994; Jpn. Appl. Dec. 3, 1992

A process is shown for removing nitrogen oxides from oxygen-rich exhaust gas containing nitrogen oxides and hydrocarbons using a catalyst composed of at least one active metal and zeolite having a molar ratio of SiO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> of at least 15, treated with a vapor of at least one silicon compound selected from alkylchlorosilanes, alkoxysilanes, alkoxyalkylsilanes, and silicon tetrachloride or treated with an alkoxysilane or silicon tetrachloride in an organic solvent. The active metal is Cu or Co.

### Catalysts for contact reduction of nitrogen oxides

T. Nakatsuji; H. Shimizu; F. Suganuma et al.  
Petroleum Energy Center Foundation; Kogyo Gijutsuin; Cosmo Oil Co. Ltd.; Sakai Chemical Industry Co.  
Jpn. Kokai Tokkyo Koho 94,15,179, Jan. 25, 1994; Appl. Apr. 16, 1991

M in zeolites having the general formula M<sub>a</sub>[(AlO<sub>2</sub>)<sub>x</sub>(SiO<sub>2</sub>)<sub>y</sub>] · zH<sub>2</sub>O (M = ions of alkali metal, alkaline earth metal, H; na = x; n = valence of M ion; y/x  $\geq 5$ ) is partially or entirely ion exchanged with Ti<sup>4+</sup>, Zr<sup>4+</sup>, or Sn<sup>4+</sup> to give zeolites for catalytic reduction of NO<sub>x</sub> using hydrocarbons and/or O-containing compounds. The catalysts are useful for treatment of flue gases, exhaust gases, etc.

### Preparation of 4,4'-dihalogenodiphenylmethane

M. Furuya; H. Minora  
Asahi Chemical Industries

Jpn. Kokai Tokkyo Koho 94,32,749, Feb. 8, 1994; Jpn. Appl. May 19, 1992

The title compounds are prepared by treating halobenzenes with methylenation agents in the presence of catalysts comprising crystalline metallosilicates M<sub>2/n</sub>O · xSiO<sub>2</sub> · yAl<sub>2</sub>O<sub>3</sub> · zW<sub>2</sub>O<sub>3</sub> (M = n-valent cation; W = B, Fe, Ti, Cr; y + z = 1; y  $\geq 0$ ; z > 0; x = 5–200).

### Preparation of 2,6-dialkylnaphthalenes as materials for 2,6-naphthalenedicarboxylic acid

H. Takeuchi; T. Senzaki; Y. Shimura  
Shinnetsu Kagaku

Jpn. Kokai Tokkyo Koho 94,40,958, Feb. 15, 1994; Appl. May 26, 1992

The title compounds are prepared by transalkylation, isomerization, or disproportionation of (alkyl)naphthalenes in the presence of acid-treated zeolite catalysts having SiO<sub>2</sub>/Al<sub>2</sub>O<sub>3</sub> (molecular ratio)  $\geq 10$ .

### Fluid catalytic cracking for producing low emission fuels

P.E. Eberly, Jr.; W.E. Winter; W.L. Schuette  
Exxon Research and Engineering Co.

U.S. 5,318,692; 5,318,694; 5,318,695, Jun. 7, 1994; Appls. Nov. 30, 1992

The feedstock is relatively low in nitrogen and aromatics and high in hydrogen content, and the catalyst is a mixture of zeolite Y and ZSM-5.

### Catalytic process for the manufacture of high-propylene, high-butylene liquefied petroleum gas (LPG) and high-octane gasoline

Y. Huo; Z. Wang; Y. Wang et al.  
China Petrochemical Corp.; Research Institute of Petroleum Processing "Sinopec"

Neth. Appl. 93,00,448, May 16, 1994; Chinese Appl. Oct. 22, 1992

The process comprises contacting the preheated hydrocarbon feed in a fluidized bed with a solid acidic catalyst containing a pentasil-type rare earth-containing high-SiO<sub>2</sub> zeolite, a rare earth zeolite Y, and a high-SiO<sub>2</sub> zeolite Y, after which the materials are converted in a reactor. This process is suitable for converting naphtha light gas oil and/or vacuum gas oil and residues, optionally mixed with coker gas oil, deasphalted oil, and other secondary fractions, and petroleum.

### Preparation of 2,6-dimethylnaphthalene

M. Abe; T. Shimizu  
Petroleum Energy Center Foundation; Cosmo Oil Co. Ltd.

Jpn. Kokai Tokkyo Koho 94,107,568, Apr. 19, 1994; Appl. Sept. 28, 1992

2,6-Dimethylnaphthalene (2,6-I) is prepared by contacting a mixture of hydrocarbons containing dimethylnaphthalenes with a pentasil-type crystalline aluminosilicate zeolite containing at least one of group IIIB and IIB elements. Isomerization of dimethylnaphthalenes not only increases the concentration of 2,6-I