7. Production of acetic acid by oxidation of butane with air under high pressure

By Ibrahim, Sabah Yassin; Hassaballah, Abid Ali
From Petroleum Science and Technology (2005), 23(1), 67-73. Language: English, Database: CAPLUS, DOI:10.1081/LFT-20009686224

Acetic acid can be prepd. by oxidn. of paraffin, naphtha, and by direct reaction between methanol and carbon monoxide. In this work acetic acid was prepd. by direct oxidn. of butane with air for the first time. The optimum selectivity was obtained at 110-120°C and 60 atm in the presence of Cobalt acetate as a catalyst. A lab. scale exptl. high-pressure reactor was constructed. Results from exptl. work were promising.

~0 Citings

9. Method and catalysts for the production of acetic acid by the gas-phase oxidation of saturated C4 hydrocarbons and their mixtures with unsaturated C4 hydrocarbons

By Rudinger, Christoph; Eberle, Hans-Jurgen
From Eur. Pat. Appl. (1999), EP 960874 A1 19991201, Language: German, Database: CAPLUS

Acetic acid is prepd. in high yield and selectivity by the gas-phase oxidn. of satd. C_4 hydrocarbons (e.g., butane) and their mixts. with unsatd. C_4 hydrocarbons (e.g., 1-butene) in the presence of oxygen or oxygen-contg. gases at 100-450°/0.2-50 bar in the presence of a layered catalyst contg. an inert, nonporous carrier (e.g., graphite) contg. catalytically active mixed oxide layer(s) consisting of: (A) ≥1 of TiO_2, ZrO_2, SnO_2, Al_2O_3; and (B) 0.1-1.5% (based on the wt. of components A) of V_2O_5. The C_4 hydrocarbon(s) are fed to the catalyst in admixt. with steam using a hydrocarbon-oxygen vol. % ratio of 0.2-25:75-99.8 and a hydrocarebon-steam vol. % ratio of 1:1-60.

~11 Citings

10. Oxidation process for the production of acetic acid from butane

By Colman, Derek Alan; Cooper, Jeremy Bernard; Lucy, Andrew Richard
From PCT Int. Appl. (1998), WO 9832725 A1 19980730, Language: English, Database: CAPLUS

AcOH is prepd. in high yield and selectivity by reacting oxygen and butane in the presence of a cobalt catalyst in a liq. reaction compn. in an oxidn. reaction zone at 120-180° while continuously maintaining a concn. of oxygen throughout the reaction zone which is equiv. to an oxygen partial pressure of >2 bar and a concn. of cobalt oxidn. catalyst of ≥0.12% cobalt and up to its limit of soly. in the aq. liq. reaction compn.

~17 Citings

15. Vapor phase oxidation of butane producing maleic anhydride and acetic acid

By Slinkard, William Earl; Baylis, Anthony Basil
From U.S. (1977), US 4052417 A 19771004, Language: English, Database: CAPLUS

Acetic acid (I) [64-19-7] and maleic acid (II) [110-16-7] were manufd. by vapor-phase oxidn. of butane [106-97-8] in the presence of molybdophosphate catalysts optionally contg. Ti, V. Nb, or Bi. Thus, 150 mL/min 9:1:5-1:1:6 butane-O-steam mixt. was passed at 246° over a SiO2-supported Mo10POx catalyst prepd. by refluxing MoO3 and H3PO4, impregnating silica beads with a soln. of the product, calcining the beads, and treating the beads with H. The product contained 33% I and 19-21% II; butane conversion was 1.5-1.7%.

~2 Citings

17. Co-production of terephthalic acid and acetic acid

By Behun, John D.
From Preprints - American Chemical Society, Division of Petroleum Chemistry (1974), 19(4), 698-12. Language: English, Database: CAPLUS

Butane is an effective promoter for the catalytic oxidn. of p-xylene to terephthalic acid (yield ≤90%, high purity); AcOH was obtained as by-product. Butane compares favorably with the more expensive MeCOEt. Among other C3-C8 aliph. hydrocarbons tried, only Et2CHMe had a promoter activity comparable to that of butane. Butane was also an effective promoter for the oxidn. of m-xylene to isophthalic acid.

~0 Citings

18. Catalytic oxidation of butane. Gas chromatographic separation and analysis of the reaction products

By Laguerie, C.; Aubry, M.
From Journal of Chromatography (1974), 101(2), 357-64. Language: French, Database: CAPLUS

The products of the oxidn. of com. grade butane (essentially a mixt. of 55-65% n-butane, 30-40% isobutane, and 5-15% propane) in air with V2O5P2O5 catalyst were identified and detd. by gas chromatog. with H carrier gas and a katharometer. O, N, and CO were sepd. on a mol. sieve column at 80°. A Porapak Q column sepd. CO2, ethylene, H2O, propane, H2CO, AcH, isobutane, and n-butane at 80°, as well as total butanes, total Me2CO + acrolein + propionaldehyde, HOAc, methyl vinyl ketone, MeCOEt, crotonaldehyde, and butanedione at 150°. Total maleic anhydride (I) + butanedione was detected by using a sep. Porapak Q column at 150°. The results were used to det. the degree of conversion of the hydrocarbons to their oxidn. products and the selectivity for producing I, i.e. the ratio of C present as I to C present in the total oxidn. products.

~1 Citing

20. Acetic acid from butane oxidation

By Sugerman, Gerald
From Fr. (1968), FR 1547470 19681129, Language: French, Database: CAPLUS

AcOH is prepd. by reaction of a liq. mixt. of n-C4H10 and AcOH with O at 160-180°/49-70 kg./cm.2 gauge pressure in the presence of 10-1000 ppm. of a sol. catalyst contg. V and a second metal of the Fe-Co group (in a 0.2-5:1 wt. ratio). Thus, an autoclave contg. 850-900 g. AcOH at 170°/70 kg./cm.2 gauge pressure was fed continuously with a mixt. of 3600 g. liquefied n-C4H10, 7.2 g. MeCOEt and V and Co naphthenate (at 3-5%) to give 100 ppm. of each metal. O was simultaneously blown through the autoclave to give 86% C4H10 conversion yielding AcOH 70, C oxides 4, and HCO2H (or formates) 1.7%.

~0 Citings

21. Analysis of products of liquid-phase oxidation of butane by gas chromatography

By Blyumberg, E. A.; Norikov, Yu. D.; Smirnov, E. S.
From Gaz. Khromatogr., Akad. Nauk SSSR, Tr. Vtoroi. Vses. Konf., Moscow (1964), 1962, 232-9. Language: Russian, Database: CAPLUS

A complex mixt. of O-contg. products of liquid phase oxidn. of butane, contg. AcH, Me_2CO, MeCOEt, Me, Et, and Bu acetates, MeOH, EtOH, BuOH, and MeO_2CH, was analyzed by gas chromatography in an app. of simple construction. The stationary solid was diatomaceous earth (particle size 0.25 to 0.5 mm.) at temps. varying between 20 and 200°, and contg. 20% of various stationary liquids. Poly(ethylene phthalate) diisobutyrate (I) gave a satisfactory sepn. of all products except MeOH and EtOH. Trimethylolpropane (II) gave a good sepn. of carbonyl compds. and esters of AcOH. The polymeric residue (III) left after the distn. of the oxidn. products of butane (compn. 75.4% C, 7.2% H, 17.4% O) was also used in several instances and was more stable than I. For the complete resolution of all components the carrier was impregnated with a mixt. of triethylene glycol (IV) and stearic acid (15 and 5 wt. %, resp.). To prevent IV from reacting with acids, the sample was passed first through a layer of K_2CO_3. Formic acid and AcOH were detd. in a sep. sample by a procedure described earlier (Gas-Chromatographie, Berlin, 1958, p. 236). For the detn. of H_2O the upper part of the column was filled with CaC_2 and the resulting C_2H_2 was detd. along with the oxidn. products. The sensitivity of the detn. of water was ±0.5%.

~0 Citings