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Alumina transition metal catalyst prodn. for use in water gas reaction - by dissolving metal or cpd. in melt of aluminium cpd. and thermal decomposition

E(31-A, 34-C2, 35) H(9-D) N(1-A, 1-C, 2-A, 2-B, 2-C, 3-C, 3-D)

In the prodn. of a catalyst contg. an Al oxide and transition metal(s) and used in the water gas reaction (prodn. of H_2 and CO_2 from steam and CO), a thermally decomposable Al cpd. is melted and the metal(s), as element(s) or cpd(s)., is dissolved in the melt. The mixt. is decomposed by heating, then cooled and brought into a form suitable for catalysis.

ADVANTAGES

The catalyst has a number of active (metal) sites, which are better distributed and excellent resistance to sulphur and mechanical stress.

PREFERRED

The melt also contains alkali metal(s) (K) or soluble cpd(s). (carbonates and/or nitrates). The Al cpd. is the nitrate. The transition metal is Cr, Mo, W, Fe and/or esp. Co and/or Ni. The catalyst can be (partly) sulphided.

EXAMPLE

Catalysts produces (A) by impregnation of (B) from a nitrate melt, with calcination at 600 deg. C, and contg. 2.5 pts CoO, 9 pts. MoO_3 and 88.5 pts. Al_2O_3 (2.0 wt % Co and 6.0 wt % Mo) were evaluated in the water gas reaction. They had a surface area of (A) 279, (B) 326 m^2/g and gave a conversion of (A) 29, (B) 30%.(16pp016).