EDI Nanosized Linde F Si(60), Al(40)

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Verified by S. Komaty, L. Tosheva, E.-P. Ng

Type Material [$Al_4Si_6O_{20}$]

Method J. Kecht, S. Mintova, T. Bein [1]

Batch Composition 2.37 $(TMA)_2O$: 0.05 Na_2O : 1.00 Al_2O_3 : 4.16 SiO_2 : 244 H_2O: 0.50 CuO: 15 NH_3

Source Materials

colloidal silica, Ludox HS-30 (SiO_2) (30 %, Aldrich)
aluminium isopropoxide (> 98 %, Sigma-Aldrich)
ammonium hydroxide solution (28 wt. % NH_3 in water, Sigma-Aldrich)
copper nitrate trihydrate (Sigma-Aldrich)
tetramethylammonium hydroxide pentahydrate (Sigma)
double distilled water (dd H_2O)

Batch Preparation

(1) [139 mg $Cu(NO_3)_2$ + 2.8 g of dd H_2O + 1.0 g of ammonium hydroxide + 0.98 g of TMAOH], mixed well at ambient temperature, then after complete dissolution [468 mg aluminium ispopropoxide and 0.96 g silica (HS-30) were added][a]
(2) Stirring for 30 min (formation of blue-colored transparent suspension)

Crystallization

Vessel: stainless steel autoclave (150 mL)
Aging: 3 days at room temperature
Hydrothermal treatment: 100 °C for 3 days
Agitation: none

Product Recovery

Centrifugation and redispersion in water; washed till pH of 10

Product Characterization

XRD: EDI; competing phases: no
Crystal size: cubic particles with size 80-150 nm

References

[1] J. Kecht, S. Mintova, T. Bein, Micropor. Mesopor. Mater. 116 (2008) 258

Notes

a. The starting mixture is prepared in a polypropylene bottle