

Contributed by Moussa Zaarour and Svetlana Mintova

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Type Material: [TMA_x] [Si_{1.7x}Al_xO_{5.4x}]

Method: S. Mintova, N. H. Olson, T. Bein [1]

Batch Composition: 5.5 (TMA)₂O : 2.3 Al₂O₃ : 10 SiO₂ : 570 H₂O

Source Materials

silica solution (Grade HS-30, 30%, Aldrich)

aluminum isopropoxide [Al(OiPr)₃] (Aldrich)

tetramethylammonium hydroxides pentahydrate (TMAOH.5H₂O, 97%, Aldrich)

distilled water

Batch Preparation

(1) [2.5 g Al(OiPr)₃ + 20.72 g H₂O], stir

(2) [5.26 g TMAOH.5H₂O + (1)], stir^a

(3) [5.1 g silica solution + (2) under stirring], stir 30 min

Crystallization

Vessel: Teflon-lined stainless steel autoclaves

Age 24 h at 40 °C

Temperature: 100 °C

Time: 48 h

Product Recovery

(1) Centrifugation (20.000 rpm, 2 h), redispersion in water in ultrasonic bath; washing till pH=8

(2) Stable colloidal suspension of nanosized crystals

Product Characterization

DLS: 25-45 nm in diameter

XRD: FAU

HRTEM: fully crystalline, uniform, single crystals octahedral morphology

References

[1] S. Mintova, N. H. Olson, T. Bein, *Angew. Chem. Int. Ed.* 38 (1999) 3201

Notes

a. Clear solution is obtained