

AFO

Nanosized AIPO-41

Al(50), P(50)

Contributed by Gerardo Majano

Verified by V. Georgieva, L. Tosheva, K. L. Wong

Type Material: [Al₁₀P₁₀O₄₀]

Method: G. Majano, K. Raltchev, A. Vicente and S. Mintova [1]

Batch Composition: 0.7 Al₂O₃ : 1.3 P₂O₅ : 0.2 TPeAOH : 2.8 DPA : 25 EtOH : 25 H₂O

Source Materials

aluminium isopropoxide (AIP, >98%, Aldrich)
tetrapentylammonium hydroxide (TPeAOH, 20% in water, Aldrich)
n-dipropylamine (DPA, 99%, Aldrich)
absolute ethanol (EtOH, AnalR NORMAPUR)
phosphoric acid (85%, Aldrich)
distilled water (H₂O)

Batch Preparation

- (1) [2.64 g AIP + 2.59 g DPA + 2.86 g TPeAOH + 10.45g EtOH +1.31 g H₂O] stir the mixture for 30 min
- (2) [(1) + 3.08 g H₃PO₄] add dropwise under stirring (1 drop/5 s, 500 rpm)

Crystallization

Vessel: Teflon-lined stainless steel autoclave
Temperature: 180° C
Time: 24 hours
Agitation: 16 hours

Product Recovery

- (1) Centrifugation (20 000 rpm, 1h)
- (2) Redisperse in water using ultrasonication; solid product and colloidal suspensions are preserved.

Product Characterization

XRD: AFO; competing phase: no
Crystal size and habit: rectangular morphology, with dimension between 80 and 500 nm.

References

- [1] G. Majano, K. Raltchev, A. Vicente and S. Mintova, *Nanoscale* 7 (2015) 5787