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## Supporting Information.

Figure S1. SEM image of the amorphous phase (a) and crystalline product (b) obtained after 36h of reaction without using the seeded support.



Figure S2. DLS curves before(a) and after (b) sonication of the synthesized FAU nanocrystals obtained after 36h of reaction without using the seeded support.



Figure S3. XRD pattern collected on micron-sized FAU zeolites.



Figure S4. DLS curves of the synthesized FAU nanocrystals after sonication.



Figure S5. DLS curves of micron-sized FAU crystals collected before sonication (red line) and after 10 (green line), 20 (pink line) and 30 (blue line) minutes of sonication.