Continuous – Flow Microwave Synthesis Of Uio-66: Effects Of Operating Conditions

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In this study, large quantities of UiO-66 were sucessfully prepared by continuous –flow processing under microwave irradation. The precursor solutions were continously transfered by a pump system into the microwave oven, which had set up at a desired temperature (80~120 oC) and irradation frequency (500 W). The results show that UiO-66 crystals with nanosacale particles (~20 nm) were obtained within a very short residence time of 5~10min, which were much less than that of conventionally sovothermal syntheses (~12h) at the same reaction temperature. The yield, porosity and cristalinity of product were affacted by HCl concentration, residence time and temperature. The prepared UiO-66 had the highest BET surface area and yield of 1320 $m^2.g^{-1}$ and 91%, respectively, which are comparable to conventionally sovothermal synthesis. Multi-gram high quality product was obtained within few minutes of reaction time, suggesting that continous-flow microwave can be a potential approach for a large scale synthesis of UiO-66.