



Solvothermal synthesis

Solvothermal synthesis involves the use of solvent under high temperature (between 100°C to 1000°C) and moderate to high pressure (between 1atm to 10000 atm) that facilitate the interaction of precursors during synthesis.

A solvent like ethanol, methanol and 2- propanol is mixed with certain metal precursors and the solution mixture is placed in an autoclave kept at high temperature and pressure in an oven to carry out the crystal growth. The pressure generated in the vessel due to the solvent vapour, elevates the boiling point of the solvent.

Example: Solvothermal synthesis of ZnO Nanoparticles



Solvothermal synthesis of ZnO Nanoparticles

Zinc acetate dihydrate is dissolved in 2- Propanol at 50°C. Subsequently, the solution is cooled to 0°C and NaOH is added to precipitate ZnO. The solution is then heated to 65°C to allow ZnO growth for some period of time. Then a capping agent (1-dodecanethiol) is injected into the suspension to arrest the growth. The rod shaped ZnO nano crystal is obtained.