

## Synthesis of nano-sized nickel particles by a bottom-up approach in the presence of an anionic surfactant and a non-ionic polymer

### Abstract

Nano-sized nickel particles have been synthesized by a bottom-up approach, using hydrazine as the reducing agent in the presence of an anionic surfactant - sodium-dodecyl sulphate (SDS). The effect of adding a nonionic polymer –poly vinyl pyrrolidone (PVP) with an anionic surfactant has been studied at two different temperatures; the rate of reduction increased as the reaction temperature was increased from 60 to 100°C. These nano-aggregated nickel particles were characterized by using SEM with EDX facilities and TEM. TEM characterization showed the presence of spherical Ni particles as fine as 10nm in diameter. However, the SEM images showed a very spiky morphology, very small spherical shaped objects were clearly observed within these spiky structures. The combination of SDS/PVP reaction produced nano-sized nickel particles which were much finer than the reactions where SDS was used on its own. PVP has shown some dispersion power, and was found to be capable of preventing nickel particles from gradual agglomeration.