POLYANILINE NANOPARTICULES: MICROEMULSION SYNTHESIS USING SDS AS A SURFACTANT

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Abstract:

Polyaniline (PANI) was synthesized by an "hybrid microemulsion polymerization" method in the presence of two sulfonic acids, such as dodecylbenzenesulfonic acid (DBSA), Naphthalene Disulfonic Acid (NDSA) in the presence of anionic surfactant **Sodium Dodecyl Sulfate** (SDS), the reaction was carried out at 18°C. Influence of SDS and dopant natures on size and conductivity of PANI nanoparticles were investigated.

From the studies, ammonium peroxydisulfate (APS) was added dropwise, through an addition funnel, at a rate of 0.1ml per 2 minute. The reaction time was 5 hours (300 min). The obtained PANI was subjected to various characterizations techniques such as: FTIR, DSC, and conductivity measurements. The morphology was characterized by scanning electron microscopy.

It was found that the SDS micelles affect the formation morphology and size as well as physical properties of the nanoparticules. Room-temperature conductivity for the PANI ranges from 36 to 80 S/cm. PANIs have a good thermal stability, high conductivity, nanoparticules morphology (200-350 nm) for DBSA+SDS system and (190 - 250 nm) for NDSA+SDS system.

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