

Synthesis of monodisperse nickel nanoparticles by w/o microemulsion method and application for upgrading catalyst

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Monodisperse metallic nanoparticles have attracted considerable interest because of their size-dependent properties. Especially, transition metallic nanoparticles have been investigated over the past few decades and applied to numerous fields such as biomedical imaging, drug delivery, catalysts for chemical and biochemical processes, batteries, and data storage devices. Furthermore, Synthetic methods, which can prepare metallic nanoparticles effectively, have been developed, and water-in-oil(w/o) microemulsion synthetic method is a most effective way to prepare monodisperse metallic nanoparticles under a relatively mild condition. Upgrading process is a process that upgrades bitumen into synthetic crude oil. As the world's supply of light crude oil is depleted, the stocks of heavy oil become more and more important. Accordingly, a research on upgrading process and catalyst have been highly increased along with greater demand of the heavy oil. In this study, we synthesized the nickel nanoparticles with different particle sizes by w/o microemulsion method and estimated a feasibility of a dispersal catalyst for upgrading heavy oil.