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(57) Abstract: A method is provided for synthesizing a core-shell nanoparticle that includes the following steps: providing a polymeric seed (in a solvent) that includes a mono-vinyl monomer cross- linked with a cross-linking agent to form the core of the nanoparticle, the core has an average diameter of from about nanometers to about 10,000 nanometers, and the core has polymer chains with living ends; adding a stabilizer to stabilize the seed and prevent the seed from precipitating out of solution; and grafting a shell species onto the living ends of the core to form the shell of the nanoparticle. A core-first synthesized nanoparticle, along with a rubber composition and tire product are also provided.

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