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Silica (SiO_2) has shown great promise as a prime candidate for the next generation anode materials for lithium-ion batteries, since it has a high lithium storage capability supported by the formation of elemental silicon from electrochemical reactions with Li-ion. Nanostructured morphology of silica composited with carbon can facilitate good conductivity and extended cycling of the electrode material. In the present studies, novel preparation methods of SiO_2 /Carbon (C) nanocomposite and nano- SiO_2 /C composite anode materials for lithium-ion batteries were developed by using mechanochemical assisted sol-gel, drip combustion in a fluidized bed reactor, and ultrasonic spray pyrolysis methods combined with a high-energy dry ball milling process. The effect of process parameters on the physical and electrochemical properties of obtained samples was extensively investigated.