Germanium nanocrystals, ranging from 3 to 10 nm with a narrow size distribution, can be synthesized by an inexpensive, simple ultrasonic solution reduction method. This is based on the reduction of GeCl$_4$ by metal hydride or alkaline in ambient condition. Effects of reduction agent, reaction condition and the concentration of GeCl$_4$ on the formation of germanium nanocrystals were investigated. The morphology and the crystal structure of Ge nanocrystals obtained at different conditions were characterised by transmission electron microscope and selected area electron diffraction. Possible mechanisms for the formation of Ge nanocrystals were discussed.

References