The results of comparison of experimental $^{35}$Cl NQR parameters for a great number of organic and organometallic compounds and estimated ones using ab initio calculations at the RHF/6-31G(d) level were systematized. The NQR frequency changes on going from one compound to another depend, in general, on the changes of populations of the Cl atom $p_{\sigma}$-orbitals in these compounds and, first of all, of populations of their less diffuse parts.

Key words: ab initio Calculations; p-orbital Populations; $^{35}$Cl NQR Frequency; Asymmetry Parameter; Chloro-containing Organic and Organometallic Compounds.