Ground-state structural properties of alkali metal chalcogenides have been studied in the framework of density functional theory (DFT) using local density approximation (LDA), Perwed-Burke- Ernzerhof (PBE) generalized gradient approximation (GGA) and Wu-Cohen (WC) GGA parameterization schemes. Electronic band structure of alkali metal chalcogenide compounds have been calculated using the aforementioned schemes as well as the modified GGA proposed by Engel and Vosko (EV). The calculated structural parameters for all 16 materials have been compared with earlier theoretical and experimental data. Electronic density of states for these compounds has been presented and behavior in electronic properties analyzed. Optical properties are obtained in terms of real and imaginary parts of incident photons frequency dependent complex dielectric function. Trends in the physical properties of this important crystal famcily have been identified and discussed in the context of their applications in technologically important opto-electronic devices.

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