

Interstellar Composite Grains

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Recent studies indicate that the interstellar grains are non-spherical and inhomogeneous; viz. porous, fluffy and composites of very small particles glued together. There is no exact theory to study the scattering properties of composite grains. We use Discrete Dipole Approximation (DDA) to calculate the extinction cross-sections of the composite grains, made up of the host silicate spheroid and graphite inclusions. We study the extinction as a function of the inclusion size and volume fraction. Using the extinction efficiencies of the composite grains we evaluate the interstellar extinction curve. The composite grain models with the axial ratio not very large (~ 1.33) and volume fraction of inclusions of $\sim 20\%$, fit the average observed interstellar extinction reasonably well. The estimated carbon (C/H) and Silicon (Si/H) abundances, derived from the composite grain models are lower than those predicted from the bare/solid grain models (e.g. model).