

On Buckyonions as the Carrier of the 2175 Angstrom Interstellar Extinction Bump

JU-HUA CHEN^{1,2}, AIGEN LI², MO-PING LI² and YONG-JIU WANG¹

¹Department of Physics, Hunan Normal University, Changsha, China

²Department of Physics and Astronomy, University of Missouri, Columbia, MO 65211, USA

In recent years buckyonions have been suggested as a carrier of the 2175 Angstrom interstellar extinction feature, based on the close similarity between the electronic transition spectra of buckyonions and the 2175 Angstrom interstellar extinction feature. We examine this hypothesis by calculating the interstellar extinction and infrared emission with buckyonions as a dust component. It is found that although dust models containing buckyonions (in addition to amorphous silicates, PAHs, graphite or amorphous carbon) can closely reproduce the observed interstellar extinction curve, they have difficulty in explaining the observed infrared emission. In particular, the non-detection of the $\sim 7\text{--}8$ micron C--H stretching bands expected from buckyonions in the diffuse interstellar medium allows us to place an upper limit on the abundance of buckyonions.