

Abstract Submitted
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Photoionization of atoms confined inside bucky-ball onions¹ VALERIY DOLMATOV, PATRICK BREWER², University of North Alabama, Florence, AL, STEVEN MANSON, Georgia State University, Atlanta, GA — We report on a theoretical study of photoionization of the atom A placed at the center of nested fullerenes C_{60} , C_{240} , and C_{540} ; the formation termed “bucky-ball onion”. The fullerene cages are represented by spherical well potentials of adjusted inner radii, widths, and potential depths. The *inner-shell* photoionization largely rules out the impact of both the change in the structure of the deepest inner-shell due to the confinement and polarizability of a bucky-ball on the photoionization process. In turn, the *near-threshold* ionization eliminates the impact of the granular structure of the bucky-ball cage on the photoionization process. This makes our model workable, to a good approximation. Progressively complicating trends in the abundance of appearing confinement type resonances in the photoionization spectra with increasing number of nested bucky-balls is unraveled and the corresponding interpretation is given. The $1s$ - and $2p$ -near- threshold photoionization of Ar from $Ar@C_{60}$, $Ar@C_{60}@C_{240}$, and $Ar@C_{60}@C_{240}@C_{540}$ is chosen as the case study.

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