Abstract Submitted
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Anionic ground and metastable states formation in low-energy electron- fullerenes interactions: Regge pole investigation[1] ALFRED Z MSEZANE, ZINEB FELFLI, Clark Atlanta University — Regge poles are generalized bound states. The hollow cage structure of fullerenes is conducive to metastable anionic states formation during the gentle electron-fullerenes collisions. Our robust Regge pole methodology is used to probe for long-lived metastable anionic formation in the fullerenes C_n(n =20, 24, 26, 28, 44, 70, 92 and 112) through the calculated elastic scattering total cross sections (TCSs). All the TCSs are found to be characterized by Ramsauer-Townsend minima, shape resonances and dramatically sharp resonances manifesting ground and metastable anionic formation during the collisions. The ground states anionic binding energies are found to match the measured electron affinities (EAs). Surprisingly, the small C_{24}, exhibiting mild atomic behavior, has the largest EA, 3.79 eV among the investigated fullerenes. Therefore it could be suitable for use in organic solar cells to resist fullerene degradation by the photo-oxidation mechanism [1]. The large C_{92} and C_{112} and the small C_{24} fullerenes could be used to catalyze the oxidation of water to peroxide through their first metastable anions as well as serve as an inexpensive single nanocatalyst for water purification [2]. 1. E. T. Hoke *et al*, *Adv. Energy Mat.* **2,** 1351 (2012) 2. S. J. Freakley *et al*, *Science* **351**, 959 (2016)

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