Abstract Submitted
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Colloidal Platinum Nanoparticles: Synthesis, Structure and Properties.[1] DANIEL KATZ, Hebrew Academy of the Five Towns and Rockaway, Cedarhurst, NY, VIKAS MURALI, Staples High School, Westport, CT, REBECCA ISSEROFF, Stella K Abraham High School, Hewlett, NY, YUAN SUN, Dept. Mat. Sci. & Eng., SUNY at Stony Brook, YIMEI ZHU, Brookhaven National Laboratory, Upton, NY, VLADIMIR SAMUILOV, NADINE PERNODET, MIRIAM RAFAILOVICH, JONATHAN SOKOLOV, Dept. Mat. Sci. & Eng., SUNY at Stony Brook — Interest in nanoparticles has risen in recent years as unique properties are being obtained from otherwise ordinary materials by reducing their sizes to molecular dimensions. We synthesized colloidal platinum nanoparticles with sizes of 1∼8 nm through four novel chemical methods and investigated their properties. These particles had an electrical resistivity of 1∼4 Ω·m and also exhibited a ferromagnetic moment. When the particles were exposed to hydrogen we measured a 15% increase in their mass, indicating a high level of hydrogen absorption. The lattice constant was measured using HRTEM and was found to be the same as bulk Pt, even after H_2 exposure, indicating no lattice distortion occurred. When dermal fibroblasts were exposed to the particles, the particles disrupted cellular actin, structure, and function. Practical applications include the use of Pt particles in semiconductor chips, hydrogen storage in fuel cells and particle chemotherapy targeted against cancer cells.

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