Low energy electron scattering from atoms: Search for nanocatalysts\(^1\)  A.Z. Msezane, Z. Felfli, Clark Atlanta University, D. Sokolovski, Queen’s University of Belfast — Manipulating the structure and the dynamics of metallic nanoparticles, attractive due to their optical, electronic and magnetic properties, including applications in catalysis, requires a fundamental understanding of the dynamic processes at the atomic level. The fundamental mechanism of catalysis at the atomic scale has already been proposed and demonstrated in Au, Pd and Au-Pd catalysis of H\(_2\)O\(_2\) through the scrutiny of low energy electron elastic total cross sections (TCSs) \([1]\). The use of mixed precious metal catalysts can produce even higher activities compared to Au alone \([2]\). Here the interplay between negative ion resonances and Ramsauer-Townsend minima that characterize low energy electron TCSs for Au is identified as the fundamental signature of nanoscale catalysts. Calculated electron elastic TCSs for Ag, Pt, Pd, Ru and Y atoms are presented as illustrations. The recent complex angular momentum methodology is used for the calculations \([3]\). It is concluded that these atoms are suitable candidates for nanocatalysts individually or in combinations.

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