乞掲示

理化学研究所原子核グループコロキウム　*2001. 11. 16*

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題目 ： Formation of superheavy elements in fusion reactions. Interaction potential well between very heavy ions.

∗ The seminar will be given in *English.*

日時 ： 2001年 11月 16日 (Fri.)　13:45 –

場所 ： RIKEN Main Bldg. 2F Seminar Room

Abstract

The process of the synthesis of superheavy elements (SHEs) is not yet understood completely. We make an attempt to describe the cold fusion reactions of the type X + (Pb,Bi) → SHE + 1n at subbarrier and near barrier energies. The process of the formation of SHEs is subdivided intothree steps: 1. The capture of two spherical nuclei and the formation of a common shape of the two touching nuclei. Low-energy surface vibrations and transferof few nucleons are taken into account in the first step of the reaction. 2. The formation of a spherical or near spherical compound nucleus. 3. The surviving of the excited compound nucleus due to evaporation of neutrons and gamma-ray emission in competition with fission. The presented model describes well the available experimental cross-section data for elements with Z=104-112 and allows for predicting cross-section values for the synthesis of so far unknown heavier elements. The interaction potential between heavy ions around the touching point is calculated for various Skyrme forces in the extended Thomas-Fermi approximation by using the frozen Hartree-Fock-Bogoliubov densities of the individual. The potential pockets in collisions leading to SHEs are discussed systematically for different projectile-target combinations.

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