Fusion cross section in ^{4,6}He+^{64}Zn collision around and below the Coulomb barrier

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A lot of experimental (see e.g. [1,2] and ref therein) and theoretical work (see e.g. [3-4]) has been performed, in recent years, in order to understand the effect of the projectile structure on the fusion mechanisms in collisions induced by light halo and/or weakly bound nuclei. It is expected that the properties of the halo nuclei would play a role in the fusion mechanism at energies around and below the Coulomb barrier.

New results concerning the measurement of fusion cross section of ^{4,6}He+^{64}Zn collision will be presented. The ^{6}He nucleus is a halo nuclei and is known to have an extended two neutron distribution. The study of the reaction induced by the stable well bound isotope, ^{4}He allows to understand the role of the two neutrons halo in the ^{6}He. The fusion cross section was measured by using an activation technique where the radioactive evaporation residues produced in the reaction were identified by the X-ray emission which follows their electron capture decay.

Comparing the two system, we observe an enhancement on the fusion cross section in the reaction induced by ^{6}He, at energy below the Coulomb barrier.

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[2] Dasgupta, Hinde *Ann.Rev. Nucl. Part. Sci* (1998) 48, 401

[3] Takigawa et al., *Phys.Lett. B* (1991) 265, 23

[4] Ito et al., *Phys.Lett. B* (2006) 637, 53