Sub-barrier two-neutron transfer in reactions with halo nuclei

M. S. Hussein[1]

[1] *Instituto de Fisica, Universidade de Sao Paulo, CP. 66318 05389-970, Sao Paulo, SP, Brazil*

We describe the transfer of two neutrons in the reaction ^{6}He + ^{238}U at sub-barrier energies. The recent data of Raabe et al. [1] has shown that the transfer cross section by far exceeds the complete fusion cross section. We atribute this to optimal condition for the two transfer to occur in this system at sub-barrier energies. Calculation using semiclassical DWBA following ref [2] does give the correct trend of the data, as shown in the figure. The complete fusion cross section is also shown. The large transfer cross section at these energies may come about from possible absorption occuring under the barrier. Further work is under way to establish concretely this behaviour in loosely bound systems [3].

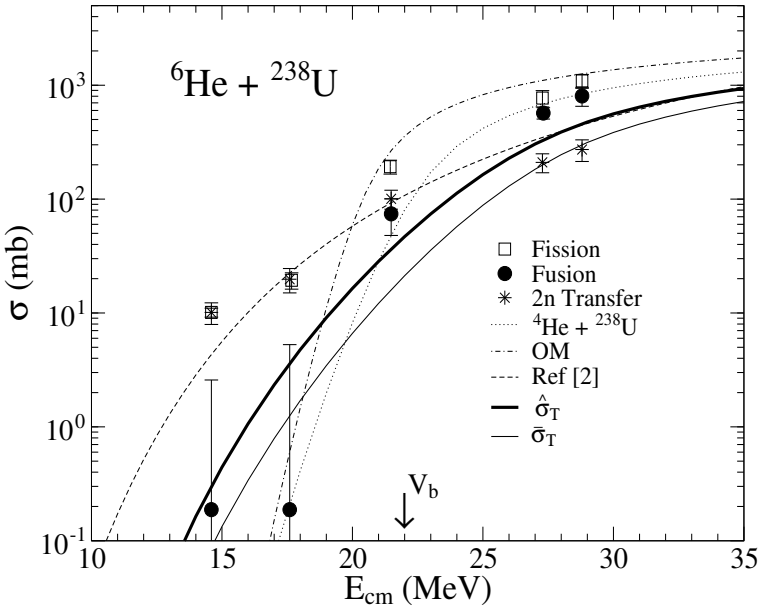

Figure 1: *The experimental data are from ref. [1]. Fusion and transfer cross sections obtained with different approaches developed here. The dotted and dot-dashed are the results from Optical Model with the same parameter as in ref. [4]. The dashed line is the Switkowsky's calculation. The thick full and full curve only the Coulomb function is considered in the calculation of T_l^T [3]. The vertical arrow indicates the position of the Coulomb barrier.*

References

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