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Investigation of fusion hindrance in a soft asymmetric system deep below the barrier

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Abstract

A steeper fall of fusion excitation function, compared to the predictions of coupled-channel (CC) models, at energies below the lowest barrier between the reaction partners, is termed as deep sub-barrier fusion hindrance. This phenomenon has been observed in many symmetric and nearly symmetric systems. Different physical origins of the hindrance have been proposed though a complete understanding is yet to be achieved. This work reports the measurement of the fusion (evaporation residue) cross sections for the system $^{19}F+^{181}Ta$, from above the barrier down to the energies where fusion hindrance is expected to come into play. CC calculation with standard Woods–Saxon potential gives a fair description of the fusion excitation function down

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