Fusion of $^{130}$Te and $^{58,64}$Ni near the Coulomb barrier

J.F. LIANG, J.M. ALLMOND, C.J. GROSS, K. LAGERGREN, P.E. MUELLER, D. SHAPIRA, R.L. VARNER, Physics Division, Oak Ridge National Laboratory — Large sub-barrier fusion enhancement has been observed in reactions where a large number of neutron transfer channels with positive Q-values exists. The fusion excitation functions for $^{130}$Te on $^{58}$Ni and $^{64}$Ni have been measured. The slope of the fusion excitation function for $^{130}$Te+$^{58}$Ni was found to be less steep than that for $^{130}$Te+$^{64}$Ni in the sub-barrier region. This may be related to the fact that there are ten neutron transfer channels with positive Q-values in $^{130}$Te+$^{58}$Ni. In contrast, $^{130}$Te+$^{64}$Ni has only one neutron transfer channel with a positive Q-value. A comparison of the sub-barrier fusion enhancement and the number of neutron transfer channels with positive Q-values in other reactions will be presented.

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