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Measurement of the $^{208}Pb(^{55}Mn, n)^{262}Bh$ Excitation Function

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The excitation function for the $^{208}Pb(^{55}Mn, n)^{262}Bh$ reaction has been measured for the first time. Using the Berkeley Gas-filled Separator at the Lawrence Berkeley National Laboratory 88-Inch Cyclotron, a total of 33 decay chains attributable to ^{262}Bh were observed at three different projectile energies. The existence of a previously reported alpha-decaying isomeric state was confirmed, although the production of the ground state was favored at all three energies. Additionally, 2 decay chains attributable to ^{261}Bh were observed. The observed cross sections are much larger than those reported for the analogous $^{209}Bi(^{54}Cr, n)^{262}Bh$ reaction, suggesting that in the latter case the projectile energies used were too high for optimum production of the 1n product. These results will be compared with predictions for the location of the excitation function maximum and the maximum cross section using the "Fusion by Diffusion" theory proposed by Swiatecki, Siwek-Wilczynska, and Wilczynski.

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