Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

Reaction Rate Measurement at the Californium User Facility (CUF) for unfolding the neutron spectrum

MOHAMMAD HANNAN, RUBEN ORTEGA, The University of Texas- Pan American — Neutron Activation Analysis was used to determine Reaction Rate measurement of several activation detectors at the ORNL Californium User Facility (CUF). The irradiations were performed with 34 mg Cf$^{252}$ neutron source strength. Ten source capsules > 34 mg were positioned concentrically around a sample cavity. We have determined absolute activity per atom of 9 detectors: Au$^{197}$ (n,γ) Au$^{198}$, Al$^{27}$ (n,α) Na$^{24}$, Al$^{27}$ (n,p) Mg$^{27}$, Fe$^{56}$ (n,p) Mn$^{5}$, Fe$^{54}$ (n,p) Mn$^{54}$, In$^{115}$ (n,γ) In$^{116}$, Ti$^{46}$ (n,p) Sc$^{46}$, Ni$^{60}$ (n,p) Co$^{60}$, Fe$^{58}$ (n,γ) Fe$^{59}$. The errors are within 1.5-8% except Ni$^{60}$ and Fe$^{58}$ have errors of 46% and 32%. These high errors may be attributed to the counting statistics. These reaction rate values will be used to unfold the neutron spectrum of the CUF using the MAXED 2000, a computer code for the deconvolution of multi sphere neutron spectrometer data and the results are discussed.

1The authors acknowledge help, advise, and using facility at ORNL-CUF to Dr. Rodger Martin and Mr. David C. Galsgow

Mohammad Hannan
The University of Texas- Pan American

Date submitted: 19 Nov 2010
Electronic form version 1.4