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NEUTRON CRYSTAL SPECTROMETER

Measurement of $^{116}_{49}In$ Resonance Parameters by Activation Technique

Çetin Cansoy, Hamit Atasoy and Çetin Ertek

Determination of resonance parameters of $^{116}_{49}In$ by activation technique is pragressing. Some preliminary results were already presented in EANDC (OR)-100 "L" page 5. To minimize the multiple scattering effects the thickness of the indium target decreased to 6.3 microns. At each of the energy point around the 1.456 ev resonance of indium, 10 irradiations were performed to improve the statistical accuracy. 8 separate energy points have been used up to now. Saturation activities and their standard deviation have been obtained.

These energies are (1,3853; 1,4047; 1,4244; 1,4446; 1,4653; 1,4864; 1,5079; 1,5244 ev). More energy points will be selected around the 1,456 ev resonance. Single level Breit-Wigner fitting procedure will be applied to find E_o and Γ.

Neutron Widths In Slow Neutron Resonances and Effect of the Diffuse Edge on Low Energy Nuclear Reactions

Çetin Cansoy

The total cross section of ^{169}Tm has been measured in the energy range 0,35 to 3.2 ev with the CNAEM crystal spectrometer using the Be (1231) crystal plane as a monachromator. A new modified method of resonance analysis applied to these experimental data the value of g (J) has been found to be 7/4.

The total cross section of ^{159}Tb has also been measured in the energy range from 0,35 to 3.65 ev with the same spectrometer using again Be(1231) crystal planes. Some what more detail could be found in EANDC(OR)-100"L" report. A complete discussion of this newly modified experimental data analysis is submitted to Nuclear Science and Engineering on 30th August 1971 for publication.

NEUTRON CRYSTAL DIFFRACTOMETER

The Measurement of Slow Neutron Reflectivity of Sodium Chloride Single Crystal

F. Bayvas

The slow neutron reflectivity of sodium chloride crystal had been measured and reported in Ref.(1) . According to these measurements the reflectivity depending on energy was determined by measuring the incident and reflected beam intensity and by taking their raties according to the equation:

$$R = \frac{I}{I_o} \qquad (1)$$

On the other hand, the reflectivity of a crystal is given by

$$R = \text{Constant} \times E^{a} \qquad (2)$$

The quantity (a) can be determined from the slope of the straight line fitting.

But it has been pointed out that the reflectivity measurements require still some improvements to establish emprical expressions and to compare them with the existing theories.

With this purpose some new measurements have been done. The ratios of the reflected beam and incaming beam intensities have been determined by considering the area under the reflection curve, using a rectangular prism of sodium chloride single crystal. The energy interval of the measurements is 0.02-0.1 ev. The first order reflections have been considered. The results on a log-log plot of reflectivity versus energy of neutron show that curve has almost a plateau behaviour in the low energy region (0.02-0.05 ev). Increase in neutron energy decreases the reflectivity.

There are some factors that effect the reflectivity, such as senond order contamination which is important for sodium chloride, primary and secondary extinctions, mosaic spread, absoption collimation, temperature effect etc.

By considering these factors the resultant aspect of the reflectivity of sodium chlcride single crystal in the reflection case have been discussed in the report which will be published very socn.

REFERENCE

1. Crystal Spectrometer Measurement of Çekmece TR-1 Thermal Neutron Spectrum

By Ö. Akyüz, F. Bayvas, Ç. Cansoy, F. Domaniç

Nukleonik 1965, p. 189-192