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ABSOLUTE MEASUREMENT OF THE 237Np AND 233U FISSION CROSS-SECTIONS AT THE NEUTRON ENERGY OF 1.9 MeV USING THE TCAP METHOD WITH MANETIC
ANALYSIS. Absolute measurement of the 237Np and 233U fission cross-sections have been performed at the neutron energy of 1.9 MeV by means of the time correlated associated particle method. The D(d, n)^{3}He reaction was a source of neutrons. To separate associated particles from the background produced from side reactions the separation of charged particle trajectories was used in magnetic field. Application of magnetic analysis permitted to use the TCAP-technique for the first time at the neutron energy region of about 2 MeV. A silicon surface-barrier detector was used to detect the associated particles. The fission fragments were registered by means of a parallel plate ionization chamber. The following results have been obtained.
δ_f(233U) = (1.93+0.07) b, δ_f(237Np) = (1.73+0.05) b.

ACTIVATION CROSS-SECTIONS FOR 31 NUCLEI FOR 2 MeV NEUTRONS. Radiative capture cross-sections for 55Mп, 58Pb, б8Zп, 82Se, 84Sr, 98Mo, 110,114.11бCd, 113In, 121,123Sb, 139La, 142Ce, 148Nd, 151Eu , 152,154Sm, 170Er, 176Yb, 180Hf, 185,187Re, 190Os, 1911г, 236U, 237Np and cross-sections for the reactions (n, n') with formation isomers for 87Sг, 111Cd, 113In, 117Sm, 180Hf have been measured for neutron energy 2 MeV using the activation method. Neutrons were produced by means of the ^{3}H(p,n)^{3}He reaction using Van de Graaf accelerator. The measurements were made relative neutron radiative capture cross-sections of 197Au and 115In, the last were calibrated relative to 238U(n, f) cross-section.

FISSION AND (n, xn) CROSS-SECTION ANALYSIS FOR 237Np. Experimental and evaluated cross-section data on fission, (n, 3n) and (n2n) reactions, leading to short lived state of nucleus 236Np are analyzed within a self-consistent statistical approach. Integral and differential data on (n, 2n) reaction are compared. Previous evaluations appear to be inconsistent with recent experimental data.

THE AVERAGE RESONANCE PARAMETERS FOR 240Pu, 235U AND 236U**.**
A SELF CONSISTENT appгoach to derive width and level spacing distributions is presented. A correlation of weak and closely spaced resonance is missing and existence of weak p-wave resonances are taken into account. The average resonance parameters for 240Pu, 235U and 236U are obtained with this technique.

ELASTIC AND INELASTIC SCATTERING OF NEUTRONS WITH ENERGY OF 4.82MeV ON VANADIUM. Double-differential cross-sections of elastic and inelastic scattering of neutrons at energy 4.82±0.07MeV on natural Vanadium have been measured at angles 30°, 45°, 60°, 90°, 120°, 150°. The measurements were performed by time-of-flight method using the tritium gas target as the neutron source. Angular distributions corresponding to the excitation of level groups (0,32+0,93), (1,609+1,813) and (2,419+2,545+2,675+2,699+2,79) MeV have been obtained.

THE ANAYTICAL FORM OF TOTAL CROSS-SECTION PROBABILITY DISTRIBUTION.
The gamma-distribution is used as an analytical form for the total cross-section probability distribution: an example in the case of chromium for ten energy intervals is given.

ON THE POSSIBLE INFLUENCE OF THE CORRELATION BETWEEN ν AND Γ_f ON THE RESONANCE SHIELDING OF $\bar{\nu}$. The effect of the phenomenological positive correlation between the average number of fission prompt neutrons and fission width on the resonance self-shielding of $\bar{\nu}$ is considered. Both an estimate in the isolated resonances approximation and direct numerical calculations with Fermi spectrum for $0.2\ eV \leq En \leq 50eV$ in 239Pu show that the increase in $\bar{\nu}$ resulting from self shielding may be 0.2 – 0.3%.

THE TECHNIQUE OF IDENTIFICATION AND ELIMINATION OF RAUGH EXCURSIONS IN EXPERIMENTAL DEPENDENCIES. The technique of identification and elimination of excursions, based on the calculations of "disagreement factors" between a single point and a group of points, is suggested. The technique has been verified on model decay curves and tested on experimental decay curves of delayed neutrons.

EXPERIMENTAL DATA ON SOME DISTINGUISHING FEATURES OF GAMMA RAY TRANSMISSION THROUGH A MEDIUM. Transmission of a 60Co radio-nuclied gamma-rays through Iron, Lead and Uranium was investigated in a "bad" geometry. Energy spectra were measured and from them buildup factors and reduction factors of 1.33 MeV gamma-rays were obtained. Substantial discrepancies were revealed between the experimental and calculated buildup factors (Pb and 238U), the reduction factor of 1.33 MeV (Pb) and the gamma-ray leakage spectra from U and Pb particularly. Adequacy of the constants applied for gamma-ray transport calculation for Lead, Uranium and other materials is to question by the data obtained.

COMPARISON BETWEEN EXPERIMENTAL AND CALCULATIONAL NEUTRON DATA FOR 238U AND GROUP CONSTANTS IN THE UNRESOLVED RESONANCE REGION. The experimental data on transmission and radiative capture self-indication ratios in the unresolved resonance region 4-100 keV for 238U have been analysed. The consistent estimates of mean resonance parameters and group constants were obtained.

FEW GROUP CONSTANTS PREPARATION UNCERTAINTIES ON THE BASE OF SIMPLIFIED SOLUTION OF THE THREE-DIMENSIONAL MULTIGROUP DIFFUSION PROBLEM IN HEXAGONAL GEOMETRY. Few group constants uncertainties induced by using approximate neutron spectra of physical zones for collapsing of multi-group cross-sections are discussed. The investigation is made for an example three-dimensional (HEX-Z) test problem of a power LMFBR. The influence of the above constants uncertainties on the main fast reactor characteristics calculation is considered.

THE TESTING OF CROSS-SECTION FUNCTIONAL CALCULATIONS CODES IN THE UNRESOLVED RESONANCE REGION. The results of the codes GRUCON, MMK and NJOY testing for treating of the evaluated neutron data for the unresolved resonance region are presented. The sets of the average resonance parameters of 238U and239Pu isotopes, same as used by Munos-Cobos et al and Ribon et al , are taken for testing. Average cross-sections, self-shielding factors and Doppler-increments of self-shielding factors are compared with the mentioned authors original results. The conclusions about reliability of neutron data

treatment procedure performed by testing codes for practical group constant preparing tasks are made.

AN EFFECTIVE HALF-LIFE VALUE FOR 252Cf: DATA ANALYSIS AND REQUIREMENTS FOR THE EXPERIMENT YIELDING THE REQUIRED DEGREE OF ACCURACY IN THE MEASUREMENT. Analysis of the methods used and of the results obtained in the 252Cf half-life measurement is carried out. In computing the weighted mean value the additional error components are taken into account as well as the uncertainties given by the authors. These contributions are due to the effect of the attendant nucleids and to the departures from the “rational” measurement procedure. A value of half-life (2,6473+0,0028) years is recommended. For reducing the error in the weighted mean value to less than 0.1%, the requirements for the experiment are stated and necessity of conducting these experiments is carried out.

METHOD OF THE STRIP AND PICK-UP REACTION DATA JOINT EVALUATION. The method of the evaluation of the one nucleon transfer reaction data based on the analysis of the systematic errors is proposed. Method uses model independent sum rules and includes strip and pick-up data to the evaluation simultaneously. The shell structure of the 46Ti and 48Ti is calculated, spins of some final nuclear states are predicted.