

Revision of LEXFOR “Scattering” (Partial Scattering)

(N. Otsuka, 2020-10-07, Memo CP-D/1002)

When the elastic scattering cannot be separated from inelastic scattering to low-lying excitation levels due to limitation of the measurement apparatus, the authors often report the sum of the cross section for elastic scattering and inelastic scattering to the low-lying excitation levels. Neutron scattering by a heavy nuclide is a typical example (e.g., neutron scattering by ^{235}U , which first excitation level is only 75 eV.)

This is “partial scattering” in the EXFOR terminology. (It is also sometimes referred to as “quasi-elastic scattering” in heavy-ion induced reaction experiments.)

Distinction of the “partial scattering” cross section from the elastic scattering cross section is important for optical potential model analysis, and I am routinely asked by EXFOR users to correct the REACTION code. I would like to propose addition of a short description on partial scattering in LEXFOR “Scattering”:

Partial Scattering

The sum of elastic scattering and a part of inelastic scattering.

REACTION Coding: SCT in SF3 and PAR in SF5

Example: (...(N,SCT)....,PAR,SIG)