

Atomic Data Compilations in EXFOR Library

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The EXFOR library has been providing experimental data sets for the ENDF library since 1970s, and its compilation scope is strongly influenced by nuclear reaction data evaluations. The ENDF/B-VIII.0 library contains a diverse set of sublibraries that address multiple user needs. Among these are the Photo-atomic, Atomic relaxation and Electro-atomic sublibraries. Similarly, the Evaluated Nuclear Structure Data File (ENSDF) library contains data on Auger electrons and X-rays. These atomic data libraries are of very broad use worldwide and play important roles in reaction, structure evaluation efforts, application and computer code developments. Obviously, atomic data evaluations need experimental database for validation purposes.

Strong interest in atomic data evaluations was expressed by attendees of the WANDA 2019, Washington, DC. The comprehensive analysis of EXFOR atomic data compilations at the conference showed four existing total photoabsorption entries: L0143, L0216, M0041, M0420 and one entry in progress L0241. These entries contain experimental data complementary to the MT=522 reaction in the Photo-atomic ENDF sublibrary. Unfortunately, it is difficult to find these data entries in EXFOR, and they provide only a limited coverage of photoabsorption cross sections over a wide range of materials and photon energies and are given the same EXFOR coding as photonuclear reactions on the same materials.

Therefore, we would suggest introducing SF8=ATM modifier for atomic data and include such data into a broad EXFOR compilation scope. The National Nuclear Data Center would investigate these data using the latest computer tools and produce a list of missing photoabsorption publications. Such effort is of high interest for the future releases of ENDF/B library, and it would provide support for international atomic data evaluations activities.