

عنوان مقاله:

A computational study on radiation shielding performances of self-passivating tungsten alloys

محل انتشار:

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خلاصه مقاله:

Tungsten with its superior features such as high melting point and relatively high thermal conductivity is significant for many high temperature applications. The materials, including tungsten, which have important mechanical properties should also be investigated by their radiation attenuating abilities. The goal of the study is to contribute to the carried out studies from a different perspective by calculating radiation-matter interaction parameters of self-passivating tungsten alloys. Radiation shielding capabilities of the alloys were determined in the range of 1 keV - 100 GeV by Phy-X/PSD code. XCOM, a well-known code, was also used for seeing the validity of obtained mass attenuation coefficients of the alloys. It was observed that half value layer and mean free path values of the studied alloys are lower, and mass attenuation coefficients are higher than those of previously reported alloys. The alloys with higher amounts of tungsten and yttrium have higher shielding ability, while the alloys with lighter elements titanium and silica have less. Additionally, depending on the obtained fast neutron removal cross section values, the studied self-passivating tungsten alloys can be also evaluated for neutron shielding. It can be concluded that the self-passivating alloys have good radiation protection potentials besides the significant mechanical properties.

کلمات کلیدی:

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