

Summery

- In the present work, energy spectra of PKA of all the open reaction channels from all the stable isotopes of tungsten and iron have been predicted with the appropriate nuclear models with the TALYS code.
- Quantification of Frenkel pair produced by the dynamics of energetic native PKA in iron and tungsten for the damage energies of 5, 30, 50, 100 & 200 keV have been carried out with MD simulation using the LAMMPS code. Results of MD simulations have been compared with the results of NRT and arc-dpa method. Constant parameters of arc-dpa method have been derived from the results of MD simulations.
- Based on the results of energy spectra and damage matrices from arc-dpa method and NRT approach, displacement damage cross section have been calculated for iron and tungsten.
- dpa value in iron with the arc-dpa approach reaches up to 25 and 66 for ITER and European demo for five-year reactor operation while in tungsten, it reaches up to 16 and 43 for ITER and European Demo reactor for five-year reactor operation.