Kinetics of xenon bubbles formation in γ-uranium

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Transport of fission products in nuclear fuels has significant effect on its properties. The process of gas-filled nanobubbles formation from single enon atoms has a particular importance. In the work this process is considered using molecular dynamics simulations and kinetic theory methods. γ-uranium is chosen as the model system for metallic nuclear fuel. The EAM potential is used for interatomic interaction [1].
A kinetic model for bubble formation based on [2] is developed. We present a system of differential equations that defines the size distribution of bubbles depending on time. The numerical solution is found and compared with the results of atomistic modelling.

[1] Smirnova D, Kuksin A, Starikov S, Stegailov V, Insepov Z, Rest J and AM Y 2013 *Modelling and Simulation in Materials Science and Engineering* **21(3)**
[2] Chandrasekhar S *Rev. Mod. Phys* **15** 59–62