

Experiences of HTTR Critical Approach Calculation and Nuclear Data/HTTR の臨界近接での経験と核データ

The High Temperature Engineering Test Reactor (HTTR) has achieved at its first criticality in 1998. Before the first criticality approach, first criticality prediction had been carried out using Monte Carlo code MVP with JENDL3.3 but it missed the first criticality point.

The MVP of that time could not treat stochastic geometry model. Therefore, the effect of double heterogeneity of coated fuel particle was evaluated by SRAC code. The evaluated double heterogeneity reactivity effect was added to the calculated result of MVP with homogenized compact model. Moreover, there were other causes for misprediction such as number of history, amount of materials, etc. After the first criticality, the MVP was improved to treat stochastic geometry model. Revised first criticality prediction with improved MVP showed better prediction but it could not predict the first criticality accurately.

The JENDL-4 library was necessary for accurate first criticality prediction by MVP. The capture cross section of carbon was revised in JENDL-4. The change in capture cross section is not so large but it gave fairly large change in calculation because of large amount of graphite in the HTTR core.

The detail in improvements at the first criticality prediction will be presented.

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