

反应堆工程

杂质硼在高温气冷堆中的燃耗特性

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摘要 在球床式高温气冷堆的堆芯和石墨反射层中, 不可避免地含有少量杂质硼。硼杂质的存在及其燃耗会对反应堆的反应性产生影响。对于多次通过的球床堆芯, 根据燃料元件的运行历史计算所有元件的硼燃耗, 对于中子注量率差别较大的反射层, 分区计算了硼燃耗。再采用微扰理论, 计算燃耗过程中硼反应性价值的变化。计算结果表明, 硼杂质燃耗很快, 因此, 硼杂质对反应性的影响降低很快。

关键词 [球床式高温气冷堆](#) [硼燃耗](#) [微扰理论](#)

分类号

Boron Depletion in High-Temperature Gas-Cooled Reactor

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Abstract There is a small quantity of boron as impurity in the core and graphite reflector of pebble bed high-temperature gas-cooled reactor (HTR). Boron and its change along depletion have influence on the reactivity of the reactor. The depletion characteristics of boron were calculated for each batch of fuel element along its operation history for the multi-pass pebble bed core, and for each region of graphite reflector. The reactivity worth of boron and its change along depletion were calculated with the perturbation theory. According to the analysis, the boron is depleted rapidly, therefore the influence on the reactivity also reduces rapidly.

Key words [pebble bed](#) [high-temperature](#) [gas-cooled](#) [reactor](#) [depletion](#) [of](#) [boron](#) [perturbation](#) [theory](#)

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