

## Fuel additives to mitigate FCCI in metallic fuels

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Fuel-cladding chemical interaction (FCCI) occurs when the nuclear fuel or fission products react with the cladding material. A major cause of FCCI in metallic fuels during irradiation is fission product lanthanides, which tend to migrate to the fuel periphery, coming in contact with the cladding. The result of this interaction is degradation of the cladding, and will eventually lead to rupture of the fuel cladding. In order to extend fuel life and safely reach higher burn-up, a method to control the lanthanides, to either decrease or mitigate FCCI, is needed. Fuel additives are one method being investigated for this purpose. The rationale behind fuel additives is to have an element dispersed throughout the fuel matrix that will react with the lanthanides as they are produced. To date, Pd, Sn, Sb, and Te have been investigated as fuel additives. A comparison of these additives, in both U-Zr and U-Pu-Zr based fuels, is presented, along with post-irradiation examination results for the Pd additive in a U-Zr fuel.