10.2 Thermal Properties

10.2.1 Melting Points

T_{MP} of UO_2 = 2865 °C
(2847 °C in some papers)

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Several Factors Influence the Melting Point

- *Stoichiometry (phase diagram)*
- *Mixed Oxide ,UO_2 -PuO_2 , (2 figs see correc.)*
- *Burn -Up (figure + table)*

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10.2.2 Thermal Expansion

Problems -Cladding stress, Poor heat transfer

Stoichiometry Effect-Figure 10.8

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10.2.3 Specific Heat (See Chapter 1)

(Important for dynamic behaviour, $\frac{k}{\rho C_p}$)

$$C_p = \left(\frac{\delta H}{\delta T}\right)_p = C_v + \left(\frac{\overset{\text{thermal expansion}}{\alpha^2}\ \overset{\text{Molar Volume}}{V}}{\underset{\text{compressibility}}{\beta}}\right)T$$

Figure 10.10