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Mr. Donald Webster

Mr. H. L. Anderson

Capture to Fission Ratio in Cyclotron Irradiation Compared with Pile

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Irradiation of $UO_2(NO_3)_2 \cdot 6H_2O$ in Cyclotron

Neutrons	Fissions	Captures	Other Captures
Fast	.03	.01	
Resonance	--	.20	
Thermal	.21	.15	.40
	.24	.36	

Ratio $\frac{\text{Captures}}{\text{Fissions}} = 1.5$

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L. M. Redman
JAN 14, 1981

You will notice that this ratio is appreciably smaller than that which I mentioned to you yesterday. This is because I had overestimated the contribution of the captures by resonance from neglecting the effect of self absorption. These effects make it difficult to give more than a rough estimate of the resonance capture factor. The ratio 1.5 is in essential agreement with the ratio 1.8, found experimentally by Coryell. The value of the ratio should be fairly independent of the place in the irradiated mass the sample is taken from.

Pile Operation

Neutrons	Fissions	Captures	Other Captures
Fast	.03	.01	
Resonance		.10	
Thermal	.45	.31	.11
	.48	.42	

Ratio $\frac{\text{Captures}}{\text{Fissions}} = .88$

The value of the ratio can be considered to be far more reliable than for the Cyclotron case. It would be altered in only a minor way for different lattice arrangements.

H. L. Anderson

HLS me

[redacted]

cc- Perlman
Coryell
Brown
Anderson ✓

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