

(11.5) Estimate the yield (% of fissions) of  $^{142}\text{La}$  in thermal fission of  $^{235}\text{U}$  given a chain yield of 5.839% for  $A = 142$ , most probable charge = 55.86 and a width parameter of 0.56. Is an appreciable amount of  $^{142}\text{Nd}$  formed directly in thermal fission of  $^{235}\text{U}$ ?

$$y_A := 5.839 \cdot \% \quad Z_p := 55.86 \quad s := 0.56 \quad Z := 57$$

$$y_{AZ} := \frac{y_A}{s \cdot \sqrt{2 \cdot \pi}} \cdot \exp\left[-\frac{(Z - Z_p)^2}{2 \cdot s^2}\right] \quad \text{Eqn. (11.17)}$$

$$y_{AZ} = 0.524 \cdot \%$$

Answers are: 0.52% and yes.