

Calculations of Average Multiplicity

Energy (MeV)	Energy bin (MeV)	Angle integrated, σ (mb/MeV)
E_1	ΔE_1	σ_1
E_2	ΔE_2	σ_2
E_3	ΔE_3	σ_3
.		
.		
.		
E_n	ΔE_n	σ_n

$$\text{Average multiplicity} = \frac{\sigma_{E \text{ min} - E \text{ max}}}{\text{Reaction Cross Section}}$$

Let, E_{min} (or E_1) = 2 MeV
 E_{max} (or E_n) = 20 MeV

$$\rightarrow \sigma_{2-20 \text{ MeV}} = (\sigma_1 * \Delta E_1 * 2) + (\sigma_2 * \Delta E_2 * 2) + (\sigma_3 * \Delta E_3 * 2) + \dots + \text{up to 20 MeV value} \quad [\text{if } \Delta E \text{ is the half of the bin energy}]$$

$$\rightarrow \sigma_{2-20 \text{ MeV}} = (\sigma_1 * \Delta E_1) + (\sigma_2 * \Delta E_2) + (\sigma_3 * \Delta E_3) + \dots + \text{up to 20 MeV value} \quad [\text{if } \Delta E \text{ is the full bin energy}]$$

$\rightarrow$ Reaction Cross Section usually given by the calculators for the particular process.