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Investigating the atom

Activity 2: Resource card 2

Geiger & Marsden Experiment – data

Angle ϕ (°)	$1/sin^4(\phi/2)$	Counts	Uncertainty in the number of counts (sqrt(N))
22.5	690	8	3
15	3445	48	7
10	17330	200	14
7.5	54650	607	25
5	276300	3320	58

Table 1: Number of alpha particles (counts) as a function of the exit angle ϕ from the gold foil target. For example, at ϕ = 5°, 3320 alpha particles were counted.
Data taken form Ref. [1]

Target	Atomic weight (A)	Atomic weight squared	Counts	Counts (corrected)	Uncertainty on the corrected counts
Gold (Au)	197.0	38809	1200	8013	231
Platinum (Pt)	195.1	38064	1000	9636	305
Tin (Sn)	118.7	14090	1400	3343	89
Silver (Ag)	107.9	11642	600	2619	107
Copper (Cu)	63.5	4032	1300	1080	30
Aluminium (Al)	27.0	729	1600	187	5
Carbon (C)	12.0	144	400	47	2

Table 2: Alpha particle counts for different targets at an exit angle of 45 degrees. The corrected counts takes into account the thickness and composition of the targets as well as the exposure time in each measurement.
Data taken form Ref. [1]

References

[1] Geiger H, Marsden E (1913) The Laws of Deflexion of α Particles Through Large Angles. *The London, Edinburgh and Dublin Philosophical Magazine and Journal of Science* **25**: 604–623. doi: 10.1080/14786440408634197