

How many atoms thick is Aluminum Foil?

This might seem impossible, but by now you know plenty of chemistry math. Follow along, and watch your SF, they matter all the way through.

Procedure:

Collect your piece of aluminum and make measurements to fill in the data table. Look carefully at the thickness of the foil.



First, Guess the number of atoms thick that you think the thin sheet of metal foil might be.

Atoms thick

Aluminum Foil Data Table

A	Length	Nearest 10 th cm
B	Width	Nearest 10 th cm
C	Mass	100th of a gram
D	Density of Al	2.70 g/cm ³
E	Atomic radius of Al	124 picometers

On a separate piece of paper, do this math step by step.

1	What is the volume of the piece of aluminum that you have? (use the density formula)
2	Once you have volume, calculate the “thinness” of the foil sheet. (use the volume formula)
3	Determine the width of one atom in picometers.
4	How many picometers are in one meter?
5	This is 4 step conversion problem: How many atoms thick is the foil sheet? step 1. Convert thickness of the foil in cm → meters. step 2. Convert these meters → picometers. step 3. Convert pm → atoms step 4. State the answer with proper SF, and units
6	Convert your answer into scientific notation.
7	The actual value is 5.7×10^4 atoms thick. Calculate your percent error.