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Avogadro

To solve this problem, I determined that in order to obtain Aluminum atoms per 1 cent, I would need to find out how many grams of Aluminum foil you can purchase with 1 cent. I continued by working backwards. I only searched for 1 equation, which will be cited when applied.

• Find Volume of whole roll:

$$L: 66.65 \text{ yds} \cdot \frac{3 \text{ ft}}{1 \text{ yd}} \cdot \frac{12 \text{ in}}{1 \text{ ft}} \cdot \frac{2.54 \text{ cm}}{1 \text{ in}} = 6095.3904 \text{ (4 SF)}$$

$$W: 12 \text{ in} \cdot \frac{2.54 \text{ cm}}{1 \text{ in}} = 30.48 \text{ cm (2 SF)}$$

$$H = 0.7 \text{ mm} \Rightarrow 0.07 \text{ cm (1 SF)}$$

$$V = 1857.875 \text{ cm}^3 \text{ (1 SF)}$$

• Find mass of roll proportional to given piece:

$$\cdot 6.35 \text{ cm} \times 6.35 \text{ cm} \times 0.07 \text{ cm piece weighed } 0.187 \text{ g}$$

$$\cdot V = 0.403225 \text{ cm}^3 \text{ (1 SF)}$$

$$\frac{0.403225 \text{ cm}^3}{0.187 \text{ g}} = \frac{1857.875 \text{ cm}^3}{x \text{ g}} \Rightarrow x = 867.6098 \text{ g (1 SF)}$$

• Find grams of 1 cent of Al. foil

$$\frac{544 \text{ cents}}{867.6098 \text{ g}} = \frac{1 \text{ cent}}{x \text{ g}} \Rightarrow x = 1.438 \text{ g (1 SF)}$$

• Turn grams into atoms. (Formula found on Clutchprep.com)

$$1.438 \text{ g of Al} \cdot \frac{1 \text{ mol of Al}}{26.982 \text{ g of Al}} \cdot \frac{6.022 \text{ E } 23 \text{ atoms of Al}}{1 \text{ mol of Al}} = 3.27 \text{ E } 22 \text{ atoms of Al (3 SF)}$$

You can purchase $3.27 \text{ E } 22$ atoms of Aluminum with 1 cent.