

## Algebra: Chemist

**Micron Technology, Inc.**

**Job Description:** Analyzes chemicals, tools, and wafers for the fabrication process. Analyzes waste products resulting from the memory chip fabrication process.

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### Problem:

The government requires that companies analyze and report the amount of ethyl lactate present in waste sent to a waste disposal company.

The ethyl lactate sample area is 6,821,193 counts. An ethyl lactate standard has a "concentration" of 10.16 wt% and a peak area of 10,617,862 counts.

What is the concentration (amount) of ethyl lactate in a solvent sample from gas chromatography data?

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### Solution:

Since the relationship is linear, use a ratio:

Concentrate of standard ( $X_1$ ) is to counts of standard ( $c_1$ ) as concentrate of sample ( $X_2$ ) is to counts of sample ( $c_2$ )

Standard	=	Sample
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$$\frac{X_1}{c_1} = \frac{X_2}{c_2}$$

$$\frac{10.16\%}{10,617,862} = \frac{X_2 \text{ wt}\%}{6,821,193}$$

$$X_2 \text{ wt}\% = 10.16\% \times \frac{6,821,193}{10,617,862} = 10.16\% \times 0.64243 = .0653 = 6.53\%$$

Concentration of sample = 6.53 wt %