

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.

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

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

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

Concentration of sample = 6.53 wt %