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Experiment 4: Metals in Cereals

Hypothesis: A hypothesis was made that sodium would have the highest mole ratio in the cereal.

Objective: The objective of this experiment was to choose a cereal that had calcium, iron, sodium, and potassium. Then, calculate the grams of the element present per gram of the food. Then, the number of moles of each element was calculated.

Materials: The material needed for this experiment was a cereal box containing all four of the metals.

Procedure: For the first part of this experiment, a cereal box containing calcium, iron, sodium, and potassium was brought and the 'Nutrition Facts' label was read. The serving size was recorded and the milligrams of each element present per serving was recorded. Then, the grams of the element present per gram of the food was calculated by dividing the milligrams of the element present by the total grams of the food per serving. Then, that number was used to find the number of moles of each of the elements by dividing it by the respective atomic mass of the element.

Observation: It was found that finding a cereal box with all four of the metals was difficult. It was found that calculating the grams of the element present per serving was easy. It was found that calculating the number of moles of each of the elements was difficult.

Discussion: Finding a cereal box with all four metals was difficult because not many cereals contain sodium and potassium. Calculating the grams of the element was easy because it was just simple division by the serving size. Calculating the number of moles of each of the elements was hard because the atomic mass had to be found on a periodic table and then use each atomic mass to divide the grams of the element.

Conclusion: The cereal chosen was Kellogg's Raisin Bran. The grams of each element present per gram of the food was: calcium- .34g, iron- .08g, sodium- 3.4g, potassium-5.1g. The moles in each element was: calcium- .008mol, iron- .001mol, sodium- .148mol, potassium- .130mol. The hypothesis was proved because sodium had the highest mole ratio. The elements arranged from highest to lowest moles available are Sodium, Potassium, Calcium, and Iron.

(4) Metals in Cereals

Hypothesis: Sodium will have the highest mole ratio.

Cereal chosen: Kellogg's Raisin Bran

Serving size: 59 g

Amount of each element per serving:

Calcium: 20mg Sodium: 200mg

iron: 4.5mg potassium: 300mg

grams of element <u>per</u> <u>gram</u> of food:

cal: $\frac{20g}{59g} = .34g$ sod: $\frac{200g}{59} = 3.4g$

iron: $\frac{4.5g}{59g} = .08g$ pot: $\frac{300g}{59g} = 5.1g$

Number of moles:

cal: $\frac{.34g}{40.1} = .008mol$ sod: $\frac{3.4g}{23.0} = .148mol$

iron: $\frac{.08g}{55.8} = .001\ mol$ pot: $\frac{5.1g}{39.1} = .130mol$

Highest to lowest moles:

Sodium, Potassium, Calcium, Iron

-2.0 Hypothesis was proved. Ratio