

1. State whether each of the following is a physical change or a chemical change. (2 pts)

a) Dissolving sugar into water.

Physical Change

b) Rusting of iron

Chemical Change

2. Classify the following as an element, compound, homogeneous mixture, or a heterogeneous mixture. (2 pts)

a) O₂ (molecular oxygen)

element

b) Pepsi

homogeneous mixture

3. How many nutritional calories are in a serving of oatmeal that contains 3 g of fat, 27 g of carbohydrates, and 5 g of protein. (3 pts)

$$3 \text{ g} \times \frac{9 \text{ kcal}}{\text{g}} = 27 \text{ kcal}$$

$$27 \text{ g} \times \frac{4 \text{ kcal}}{\text{g}} = 108 \text{ kcal}$$

$$5 \text{ g} \times \frac{4 \text{ kcal}}{\text{g}} = 20 \text{ kcal}$$

Total nutritional calories = **155 kcal** (or 155 Cal)

4. A 25.0 g sample of molten iron releases 1230 cal as it cools from 2000 °C to its freezing point at 1535 °C. It then releases an additional 1590 cal as it solidifies. How much energy is needed to heat the solid iron from 1535 °C to 2000 °C? (3 pts)

