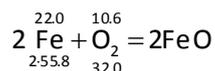


For the following reaction, 22.0 grams of iron are allowed to react with 10.6 grams of oxygen gas.

iron (s) + oxygen (g) → iron(II) oxide (s)

What is the maximum amount of iron(II) oxide that can be formed?

Solution:

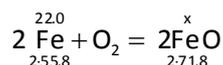


For the equation of reaction and basic data determine, what component is taken in plenty. For that find number moles of each component:

$$n(\text{Fe}) = \frac{22.0}{2 \cdot 55.8} = 0.197 \text{ mole};$$

$$n(\text{O}_2) = \frac{10.6}{32.0} = 0.331 \text{ mole}.$$

So, oxygen is taken in plenty. Therefore, the amount of iron(II) oxide determined from the mass of iron:



From the reaction, the mass of iron is:

$$x = \frac{22.0 \cdot 2 \cdot 71.8}{2 \cdot 55.8} = 28.3 \text{ g}.$$

Answer:

The maximum amount of iron(II) oxide (FeO) is 28.3 g.