13.6 grams of Fe reacts with 7.2 grams of O2 to form Fe3O4 according to:

3Fe + 2O2 --> Fe3O4
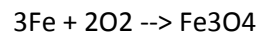
After properly balancing this equation, identify the LIMITING reactant

Solution:

From the equation: molar ratio n(Fe):n(O2) = 3:2

n(Fe) = m(Fe)/M(Fe)= = 13.6/55.8= 0.243 mol

n(O2)= m(O2)/M(O2) = 7.2/32=0.225 mol

0.243/3=0.081

0.225/2= 0.1125, 0.081<0.1125, Fe is limited

Answer: Fe is limited reactant