Task:

how many grams of chromium are needed to react with an excess of CuSO4 to produce 27 g Cu

Solution:

The chemical equation for this reaction is:
$3CuSO_4 + 2Cr = Cr_2(SO_4)_3 + 3Cu$

The amount of Cu produced in reaction is
n(mol) = m(g) / MW(g/mol)
n(Cu) = 27 / 63.5 = 0.425 mol

According to the chemical equation
n(Cr) = ⅔ · n(Cu)
n(Cr) = ⅔ · 0.425 = 0.283 mol

The mass of Cr is
m(g) = n(mol) · MW(g/mol)
The molar weight of Cr is equal to its atomic weight in the periodic table of elements (MW(Cr) = 52 g/mol)

m(Cr) = 0.283 · 52 = 14.7 g

Answer: m(Cr) = 14.7 g