A sample of compound weighing 83.5 g contains 33.4 g of sulfur. The rest is of oxygen. What is the empirical formula?

Solution:

m(sample)=83.5g

m(S)=33.4g

m(O)=m(sample)-m(S)=83.5-33.4=50.1g

n(S)=m(S)/M(S)=33.4/32=1.04mol

n(O)=m(O)/M(O)=50.1/16=3.13mol

n(S):n(O)=1.04:3.13

n(S):n(O)=1:3

empirical formula of unknown compound is SO_3

Answer: SO_3