Derive how to find amount of oxygen

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How to find amount of oxygen (O2), , at Phi=1?

balance C: X=A

balance H: Y=2\*B

balance O: Z+2\*=2\*A+B

where: X is the total number of carbon atoms in the fuel species

Y is the total number of hydrogen atoms in the fuel species

Z is the total number of oxygen atoms in the fuel species

My code finds the amount of oxygen (O2) at phi=1, this is the variable ‘amount\_oxidant’. It can handle multiple fuel species, only one fuel ratio at a time.

Pseudo code:

-Find what number C,H,O are on the list of elements, put this into variables c\_order, h\_order, o\_order

-go through the fuel species and add the amount of C/H/O to the to c\_tot, h\_tot, o\_tot variables

-then use the equation derived above to calculate amount\_oxidant, which is the amount of O2 for phi =1 (fuel equivalence ratio)

-then the actual amount of O2 used in the reactor is: amount\_oxidant/phi

Equivalence ratio:

st means stoichiometric which is the same as saying phi=1

lets say we want to find out how much oxygen to put in to methane and air at phi=2?

Well, at stoichiometric:

we find that

therefore at phi=2

if you just assume that the amount of fuel will be constant, then

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