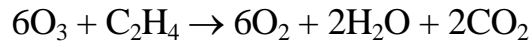Incomplete conversion of ethylene. Ethylene (C_2H_4, M = 28.05 g/mol) is a gaseous hormone emitted by ripening fruits. In order to control ripening in storage chambers, ethylene is removed by its reaction with ozone (O_3):

$$6O_3 + C_2H_4 \rightarrow 6O_2 + 2H_2O + 2CO_2$$

To insure all ethylene is removed, 80% excess O_3 is supplied. Assume ozone reacts instantaneously with ethylene regardless of their concentrations (not strictly true...this is for illustration only). In order to generate ozone, dry air is passed through an ozonator where 7% conversion takes place:

$$3O_2 \rightarrow 2O_3$$
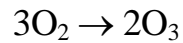
It is desired to control the ripening of 16 tons of apples which generate 6.5 g C_2H_4/ton·h.

Determine:

    i.   The quantity of ozone which must be generated by the ozonator.
    ii.   The quantity of dry air which must be supplied to the ozonator.
    iii.   The composition of the gas exiting the storage chamber.

Basis: 100 mol AIR/h in stream A