Answer on Question 75948 in General Chemistry
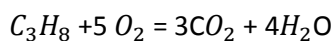
.t=525°C

.p=14.3 atm

.m (H_2O) =15.0 g

V(C_3H_8)=?

Solution: write the reaction of combustion of propane

C_3H_8 +5 O_2 = 3CO_2 + 4H_2O

Find the amount of substance of water

.n (H_2O) = $\frac{m}{Mr}$=$\frac{15}{18}$= 0.8 mol

Mr (H_2O) =2× Ar(H) +Ar (O)=2+16=18

. n (C_3H_8) =$\frac{1}{4}$ n (H_2O) =$\frac{1}{4}$× 0.8=0.2 mol

V(C_3H_8)= n × V_M= 0.2× 22.4=4.48 L

According to combined gas law

$\frac{p_0 \times V_0}{T_0} = \frac{p_1 \times V_1}{T_1}$

V_0= $\frac{p_1 \times V_1 \times T_0}{p_0 \times T_1}$ = $\frac{14.3 \times 4.48 \times 273}{1 \times 798}$=21.9 L under standard condition p=1 atm, T=273 K

For solution the task translate °C $into$ K according T=t +273°C=525+273=798 K