HW6_after ignition 2

Due Oct 28 at 12:59pm **Points** 9 **Questions** 5 **Time Limit** None
Allowed Attempts 3

Take the Quiz Again

Attempt History

	Attempt	Time	Score
LATEST	Attempt 1	4,679 minutes	9 out of 9

Correct answers are hidden.

Score for this attempt: **9** out of 9
Submitted Oct 27 at 9:42pm
This attempt took 4,679 minutes.

Question 1

1 / 1 pts

An OSU FPST alumni developed a new fire suppressant which is composed of 20 vol% of N2 and 80 vol % of CO2. How many moles of this suppressant should be added to extinguish one mole of methane flame? Use the critical adiabatic flame temperature at LFL. Methane's heat of combustion is 50 kJ/g.

Use the following specific heat values:

CO2 = 54.3 J/mole-K, H2O = 41.3 J/mole-K, N2 = 32.7 J/mole-K.

- (●) 4.6 moles
- ( ) 2.3 moles
- ( ) 3.5 moles
- ( ) 5.9 moles

Question 2 5 / 5 pts

Assuming an enclosure filled with the combustion products of methane at stoichiometry at 1 atm, what is the vapor pressure of H2O in the enclosure in atm? Round your answer to two decimal places and do not include any unit.

0.19

Question 3 1 / 1 pts

Calculate flashpoint [^{o}C] of methanol with the following values.

log10P=A - B/(T+C)

where, P = vapor pressure [bar], T = temperature [K]

LFL (Vol%) = 6.7, A = 5.15853, B = 1569.613, C = -34.846, ΔH_{vap}= 38.3 kJ/mole

- (●) 9
- ( ) -9
- ( ) 6

-6

Question 4

1 / 1 pts

The ignition temperature of a material is 350 °C. If the room is initially at 20 °C, when does the material reach the ignition temperature if exposed to a heat flux of 10 kW/m^2? Assume thermally thin material, no heat losses, k=0.12 W/m-K, density=510 kg/m^3, c_p=1.3 J/g-K, d=1 mm.

- (●) 22 sec
- ( ) 40 sec
- ( ) 218 sec
- ( ) 14 sec

Question 5

1 / 1 pts

Calculate the ignition time of the thermally thick material with the following conditions;

- Thermal conductivity = 0.12 W/m-K,
- Density = 510 kg/m3,
- Initial temperature = 20 ^{o}C,
- Specific heat = 1.3 J/g-K,
- d = 2 mm,
- Minimum ignition surface temperature = 400 ^{o}C,
- Exposed heat flux = 15kW/m^2

- 40 sec
- 22 sec
- 68 sec
- 14 sec

Quiz Score: **9** out of 9