Chem THERMOCHEMICAL EQUATIONS & GIBBS' FREE ENERGY Practice (#3)

THERMOCHEMICAL EQUATION D.A.

For questions 2-7, use the equation for the incomplete combustion of propane, C_3H_8.
ΔH = -2043.9 kJ/mol.

1) Write the balanced equation. Label that all substances in the reaction are gases.

2) How many g of propane must be reacted to produce 6218.0 kJ of energy?

3) How much energy, in kJ, is produced when 450 g of water is made?

4) Calculate the number of grams of oxygen needed to generate 219.55 kJ.

5) How much energy in kJ is generated if 35.00 grams of oxygen are used?

6) Calculate the amount of energy in kJ produced when 74.84 g of propane reacts.

7) Calculate the grams of carbon monoxide produced when 1919.07 kJ of energy is evolved.

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GIBBS' FREE ENERGY $\Delta G = \Delta H - T\Delta S$

For questions 8-15, calculate ΔG in kJ and indicate if the reaction will be spontaneous
(exergonic) or nonspontaneous (endergonic).

8) ΔH = -87.88 kJ; ΔS = -120. J/K;   T = 292.3 K

9) T = 411.95 K; ΔH = +556.56 kJ; ΔS = +333 J/K

10) ΔS = -74.4 J/K;   T = 112.2 K; ΔH = +1767.34 kJ

11) ΔH = -609.27 kJ; ΔS = +45.0 J/K;   T = standard temperature

12) T = 298.00 K; ΔS = -333 J/K; ΔH = +1616 kJ

13) T = 627.4 K; ΔH = -3654.3 kJ; ΔS = +921.78 J/K

14) ΔS = -398.3 J/K; T = 311 K; ΔH = -899 kJ

15) T = standard temperature; ΔS = -68.0 J/K ; ΔH = -3896.1 kJ