Quiz 4

Sample problems involving Clausius-Clapeyron Equation

1. A particular compound has an enthalpy of vaporization of 28900 J/mol. At 278 K it has a vapor pressure of 103 mmHg. What is its vapor pressure at 309 K? (R = 8.31 J/(K· mol))
    a) 29.4 mmHg
    b) 194 mmHg
    c) 107 mmHg
    d) 99.5 mmHg
    e) 361 mmHg

2. A liquid has an enthalpy of vaporization of 30.8 kJ/mol. At 273 K it has a vapor pressure of 102 mmHg. What is the normal boiling point of this liquid? (R = 8.31 J/(K· mol))
    a) 273 K
    b) 320 K
    c) 292 K
    d) 238 K
    e) 257 K

3. In a certain mountain range, water boils at 92°C. What is the atmospheric pressure under these conditions? The enthalpy of vaporization of water at 100°C is 40.7 kJ/mol. (R = 8.31 J/(K· mol))
    a) 570 mmHg
    b) 1010 mmHg
    c) 243 mmHg
    d) 237 mmHg
    e) 2380 mmHg

4. For a particular liquid, raising its temperature from 298 K to 318 K causes its vapor pressure to double. What is the enthalpy of vaporization of this liquid? (R = 8.31 J/(K· mol))
    a) 115 kJ/mol
    b) 288 kJ/mol
    c) 27.3 kJ/mol
    d) 2.53 kJ/mol
    e) 270 kJ/mol

5. Knowing that ΔH_{vap} for water is 40.7 kJ/mol, calculate P_{vap} of water at 37°C.
    a) 6.90 torr
    b) 12.4 torr
    c) 18.7 torr
    d) 25.4 torr
    e) 52.6 torr

6. What is the enthalpy of vaporization of a compound that has a vapor pressure of 157 mmHg at 253 K and 0.358 mmHg at 191 K? (R = 8.31 J/(K· mol))
    a) 3.13 kJ/mol
    b) 0.838 kJ/mol
    c) 815 kJ/mol
    d) 39.4 kJ/mol
    e) 389 kJ/mol