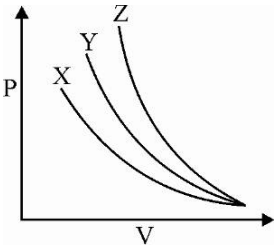
Date Planned : __ / __ / __	Daily Tutorial Sheet-14	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level-3	Exact Duration :_____

153. P–V plot for three gases (assuming ideal behaviour and similar condition) for reversible adiabatic compression are given in the figure below:



Plots X, Y and Z should correspond to respectively:

(A) CO_2, Cl_2 and Ne

(B) SO_2, N_2O and He

(C) He, N_2 and O_3

(D) NH_3, H_2S and Ar

154. An ideal gas at initial pressure P_i and volume V_i undergoes reversible expansion to the same volume V_f, either isothermally or adiabatically. Consider the following statements :

1. $|P_f \text{ (adiabatic)}| < |P_f \text{ (isothermal)}|$ **2.** $|W(\text{adiabatic})| < |W(\text{isothermal})|$

3. $|T_f(\text{adiabatic})| < |T_f \text{ (isothermal)}|$ **4.** $|q(\text{adiabatic})| < |q(\text{isothermal})|$

where the symbols have their usual meaning.

How many statements of the above are correct ?

(A) Only one **(B)** Only two **(C)** Only three **(D)** All

155. Two moles of an ideal gas undergo the following process :

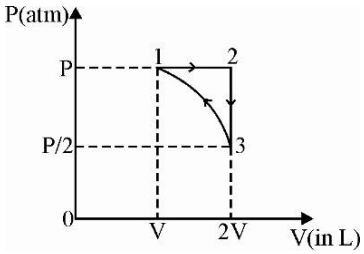
a. a reversible isobaric expansion from (P atm, V L) to (P atm, 2V L)

b. a reversible isochoric change of state from (P atm, 2V L) to (P/2 atm, 2V L)

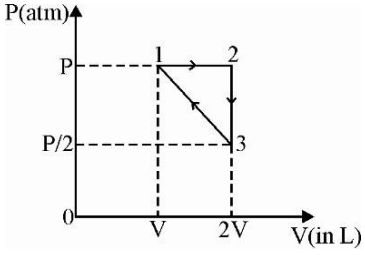
c. a reversible isothermal compression form (P/2 atm, 2V L) to (P atm, V L)

Sketch with labels each of the process on the same P – V diagram

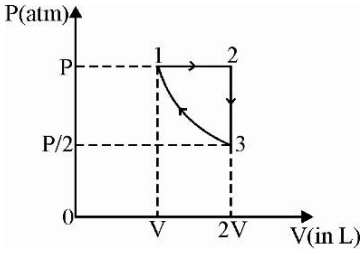
(A)



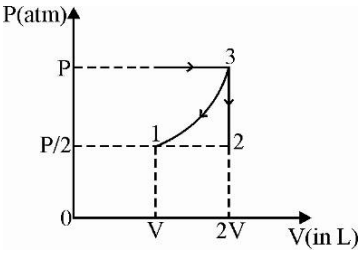
(B)



(C)



(D)



156. Calculate the final pressure of a sample of carbon dioxide that expands reversibly and adiabatically from 57.4 kPa and 1.0 L to a final volume of 2.0 L. Take $\gamma = 1.4$.

(A) 1 KPa **(B)** 10 kPa **(C)** 20 KPa **(D)** 22 kPa

157. The heat evolved from the combustion of carbon is used to heat water. Assuming 50% efficiency, calculate mole of water vaporized at its boiling point if $\Delta H_f(CO_2) = -94$ Kcal / mol and $\Delta H_{vap}(H_2O) = 9.6$ kcal / mol and 6g C is undergoing combustion.

(A) 1.21 mole **(B)** 2.42 mole **(C)** 4.89 mole **(D)** 9.7 mole

***158.** If w_1, w_2, w_3 and w_4 are work done in isothermal, adiabatic, isobaric, and isochoric reversible expansion for an ideal gas, respectively, then

(A) $w_3 > w_1$ **(B)** $w_1 > w_2$ **(C)** $w_2 > w_4$ **(D)** $w_4 > w_2$