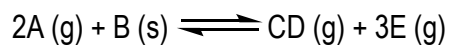


CONCEPT: K_p AND K_c

- Recall, *equilibrium constant (K_{eq})* can be expressed as _____ or _____
 - K_p: used when dealing with gases (_____)
 - K_c: used when dealing with aqueous solutions in _____ (M)
- K_p and K_c are related through the following formula:

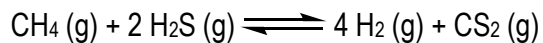
K _p vs K _c Formula		
$K_p = K_c (RT)^{\Delta n}$	<ul style="list-style-type: none">□ K_p & K_c = equilibrium constants□ R = gas constant = $0.08206 \frac{\text{L}\cdot\text{atm}}{\text{mol}\cdot\text{K}}$□ T = temperature in Kelvin	$\Delta n = n_{\text{products}} - n_{\text{reactants}}$ □ moles (n) = gas coefficients

EXAMPLE: Calculate K_p for the following reaction with K_c = 0.77 at 570 K:



CONCEPT: K_p AND K_c

PRACTICE: Partial pressures of the following equilibrium mixture at 955 K are: 130 torr methane, 92 torr hydrogen sulfide, 167 torr hydrogen gas and 532 torr carbon disulfide. What is the value of K_c at 955 K?



PRACTICE: Consider the hypothetical reaction: ? X (g) + 3 Y (g) \rightleftharpoons 3 Z (g), where K_p = 1.16 x 10⁻³ and K_c = 1.3 at 135°C. Find the value of the coefficient of X.

CONCEPT: K_p AND K_c

Value of Δn

$$K_p = K_c (RT)^{\Delta n}$$

- The value of _____ can help determine if K_c is greater, less than or equal to K_p .

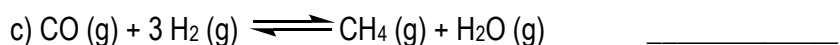
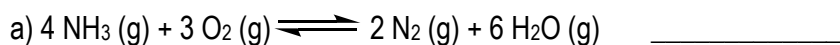
□ If _____ moles of gas ($\Delta n \geq 1$), then $K_p > K_c$

$\Delta n \geq 1$: K_c K_p

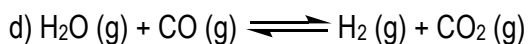
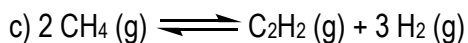
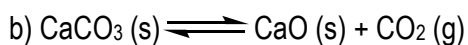
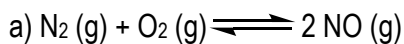
$\Delta n < 0$: K_c K_p

$\Delta n = 0$: K_c K_p

EXAMPLE: For the following reactions, identify whether K_p is greater than, less than or equal to K_c .



PRACTICE: For which reaction(s) will $K_p = K_c$?



PRACTICE: Select the correct choice below for the reaction: $\text{PCl}_5 (\text{g}) \rightleftharpoons \text{PCl}_3 (\text{g}) + \text{Cl}_2 (\text{g})$

a) $K_p = K_c$

b) $K_p > K_c$

c) $K_p < K_c$

d) $K_{eq} = K_p$

e) None of the following