

## Eq ⑦ Equilibrium Calculations (ICE) ③

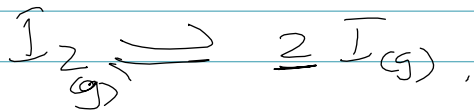
\* The dissociation of iodine occurs as following:  

$$I_2(g) \rightleftharpoons 2 I(g) \quad K_c = 3.8 \times 10^{-5} @ 1000 K$$

What are the conc. of the gases if you start with 0.0456 mol  $I_2$  in a 2.30 L flask?

$$\frac{0.0456}{2.30} = 0.0198 M$$

Ans



I	0.0198	0	$x^2 - 2x + 1 = 0$
C	-x	+2x	
E	$(0.0198 - x)$	2x	

$$K_c = \frac{[I]^2}{[I_2]} ; 3.80 \times 10^{-5} = \frac{(2x)^2}{(0.0198 - x)}$$

open up eq.  $(3.80 \times 10^{-5})(0.0198 - x) = 4x^2$  ←

$$\frac{4x^2}{a} + \frac{(3.80 \times 10^{-5})x}{b} - \frac{7.52 \times 10^{-7}}{c} = 0$$

quadratic calc.  $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

$$x = \frac{-3.80 \times 10^{-5} \pm \sqrt{(3.80 \times 10^{-5})^2 - 4(4)(-7.52 \times 10^{-7})}}{2(4)}$$

$$= \frac{(-3.80 \times 10^{-5}) \pm (3.47 \times 10^{-3})}{8}$$

$$x = 4.29 \times 10^{-4} \text{ or } x = -4.39 \times 10^{-4}$$

at eq.  $[I] = 2x = 2 \times 4.29 \times 10^{-4} = 8.58 \times 10^{-4} M$   
 $[I_2] = 0.0198 - 4.29 \times 10^{-4} = 0.0194 M$