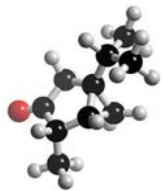


EQUILIBRIUM QUANTITIES 1

Name



Work out the actual number of moles of each species are present at equilibrium.

- 1) $\text{CH}_4(\text{g}) + \text{H}_2\text{O}(\text{g}) \rightleftharpoons \text{CO}(\text{g}) + 3 \text{H}_2(\text{g})$
 initial moles 1 1 0 0
 equilibrium moles 0.4
- 2) $\text{N}_2(\text{g}) + 3 \text{H}_2(\text{g}) \rightleftharpoons 2 \text{NH}_3(\text{g})$
 initial moles 0.1 0.1 0
 equilibrium moles 0.07
- 3) $\text{H}_2(\text{g}) + \text{I}_2(\text{g}) \rightleftharpoons 2 \text{HI}(\text{g})$
 initial moles 10 10 0
 equilibrium moles 3
- 4) $\text{CO}_2(\text{g}) + 3 \text{H}_2(\text{g}) \rightleftharpoons \text{CH}_3\text{OH}(\text{g}) + \text{H}_2\text{O}(\text{g})$
 initial moles 1 1 0 0
 equilibrium moles 0.2
- 5) $2 \text{SO}_2(\text{g}) + \text{O}_2(\text{g}) \rightleftharpoons 2 \text{SO}_3(\text{g})$
 initial moles 2 2 0
 equilibrium moles 0.7
- 6) $\text{PCl}_5(\text{g}) \rightleftharpoons \text{PCl}_3(\text{g}) + \text{Cl}_2(\text{g})$
 initial moles 1 1 1
 equilibrium moles 1.8
- 7) $\text{CH}_4(\text{g}) + \text{H}_2\text{O}(\text{g}) \rightleftharpoons \text{CO}(\text{g}) + 3 \text{H}_2(\text{g})$
 initial moles 1 1 1 1
 equilibrium moles 1.6

- 8) $\text{N}_2(\text{g}) + 3 \text{H}_2(\text{g}) \rightleftharpoons 2 \text{NH}_3(\text{g})$
 initial moles 10 0 10
 equilibrium moles 9
- 9) $2 \text{H}_2(\text{g}) + \text{CO}(\text{g}) \rightleftharpoons \text{CH}_3\text{OH}(\text{g})$
 initial moles 0.5 0.5 0
 equilibrium moles 0.1
- 10) $\text{SO}_2\text{Cl}_2(\text{g}) \rightleftharpoons \text{CH}_3\text{OH}(\text{g}) + \text{Cl}_2(\text{g})$
 initial moles 2.0 0 0
 equilibrium moles 0.4
- 11) $2 \text{H}_2(\text{g}) + \text{CO}(\text{g}) \rightleftharpoons \text{CH}_3\text{OH}(\text{g})$
 initial moles 1.2 2.0 0
 equilibrium moles 1.8
- 12) $\text{CO}_2(\text{g}) + 3 \text{H}_2(\text{g}) \rightleftharpoons \text{CH}_3\text{OH}(\text{g}) + \text{H}_2\text{O}(\text{g})$
 initial moles 1.0 1.0 0 0
 equilibrium moles 0.7
- 13) $2 \text{A} + \text{B} \rightleftharpoons \text{C} + 3 \text{D}$
 initial moles 5.0 10.0 0 0
 equilibrium moles 0.5
- 14) $\text{A} + 3 \text{B} \rightleftharpoons 2 \text{C} + \text{D}$
 initial moles 2.0 1.0 0 0
 equilibrium moles 0.4
- 15) $\text{N}_2(\text{g}) + 3 \text{H}_2(\text{g}) \rightleftharpoons 2 \text{NH}_3(\text{g})$
 initial moles 2 2 0
 equilibrium moles 2x