7 Equilibrium – Part 1 — Answers

Answers

Work through these after trying the questions yourself.

7.1 The forward and reverse rates are equal; the concentrations stay constant.
7.2 So that nothing enters or leaves (no products escape), letting the rates balance.
7.3 If a system at equilibrium is changed, the equilibrium moves to oppose (reduce) that change.
7.4 Towards the reactants (the endothermic direction).
7.5 No — a catalyst speeds up the forward and reverse reactions equally, so equilibrium is reached faster but its position is unchanged.
7.6 $K_c = [\mathrm{HI}]^2/([\mathrm{H_2}][\mathrm{I_2}]) = 1.6^2/(0.20 \times 0.20) = 64$.

7.7 (a) Higher pressure shifts the equilibrium towards the side with *fewer* gas molecules ($4 \rightarrow 2$), i.e. towards NH_3, so the yield rises. (b) The forward reaction is exothermic, so raising the temperature shifts the equilibrium in the *endothermic* (reverse) direction, lowering the yield.