Competition Corner: Two-System Evidence

g10_u04_w16

State the reaction form, conditions, comparison, and limitation for every claim.

1. For $2A(g) \rightleftharpoons B(g)$ at one temperature, $K_c = 5.00\ \text{M}^{-1}$. A snapshot has $[A] = 0.100$ M and $[B] = 0.0200$ M. Calculate Q_c, predict direction, then explain how a volume decrease would be reasoned about separately.

2. For $M(aq) + N(aq) \rightleftharpoons O(aq)$, $K_c = 3.00\ \text{M}^{-1}$. Create two distinct positive concentration snapshots, one with $Q_c < K_c$ and one with $Q_c > K_c$. Show calculations and explain why neither gives a rate.

3. A catalyst is added to a gas system while it is adjusting after compression. List one likely kinetic observation and three equilibrium claims that cannot follow from the catalyst addition alone.

4. Compare the statements "the gas model favors fewer particles" and "the solution model has $Q < K$." Explain what evidence each needs and why neither is a universal slogan.

5. A report gives one flat concentration point after a perturbation. Write a compact evidence plan for deciding whether equilibrium was actually re-established.