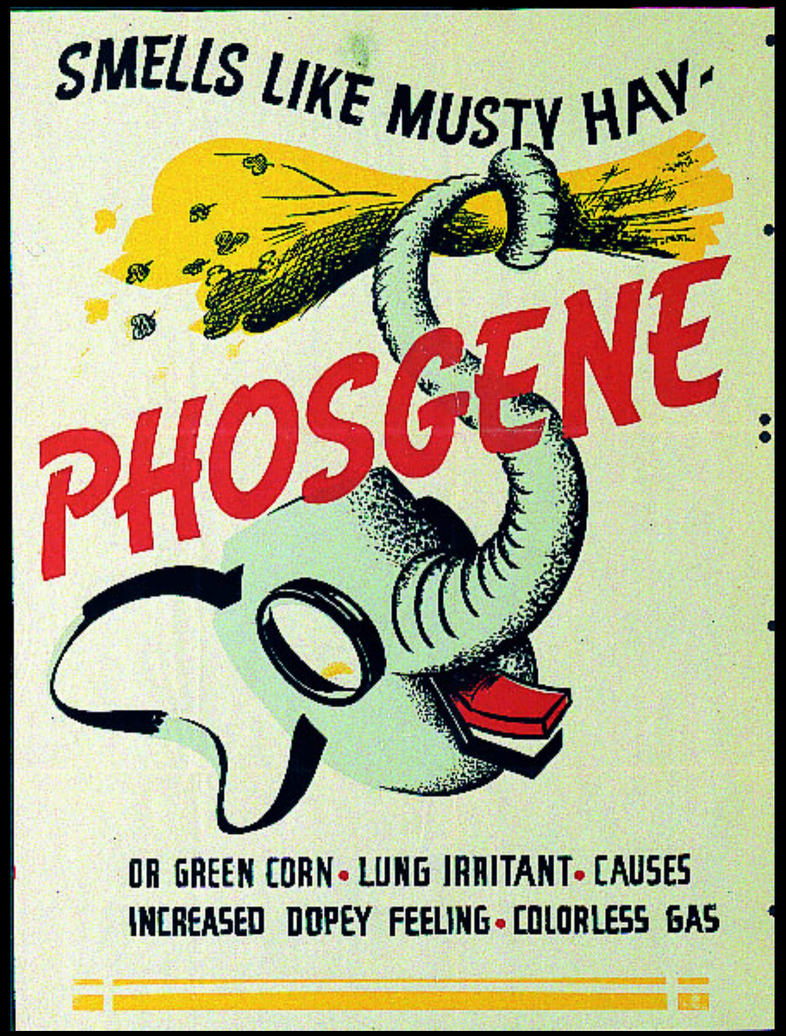

The Equilibrium Constant

$$CO(g) + Cl_2(g) \rightleftharpoons COCl_2(g)$$

$$K_c = 4.57 \times 10^9$$

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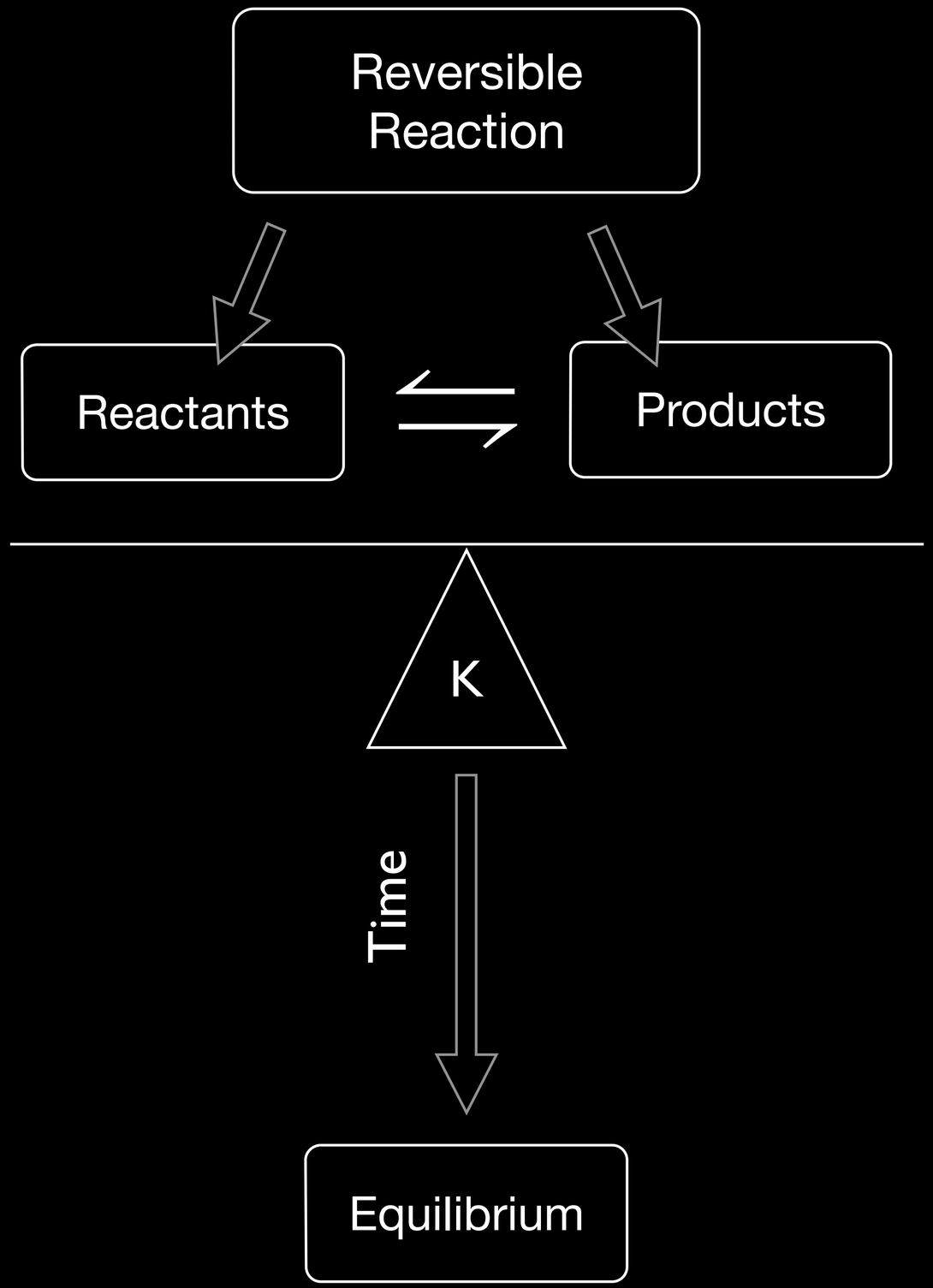
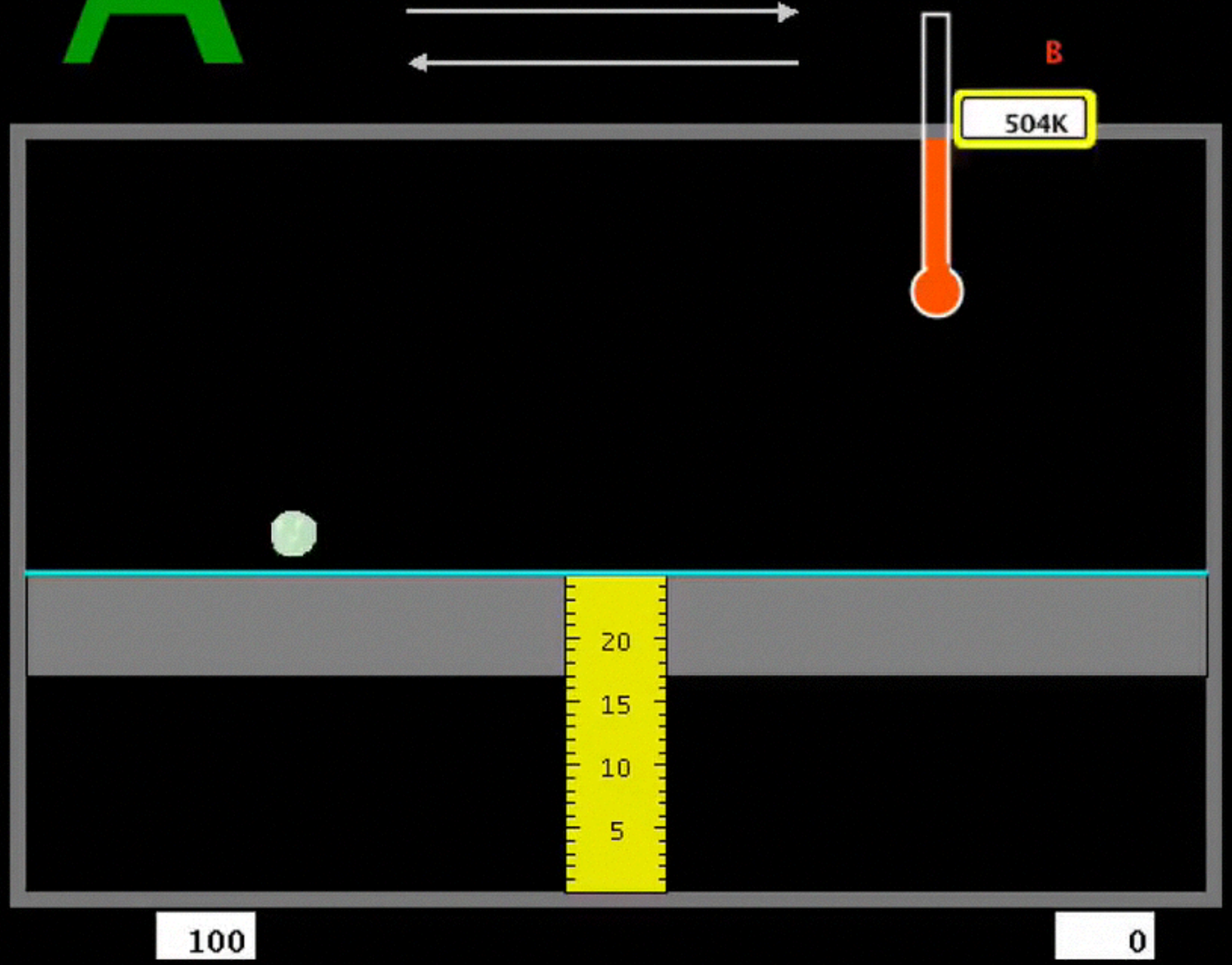
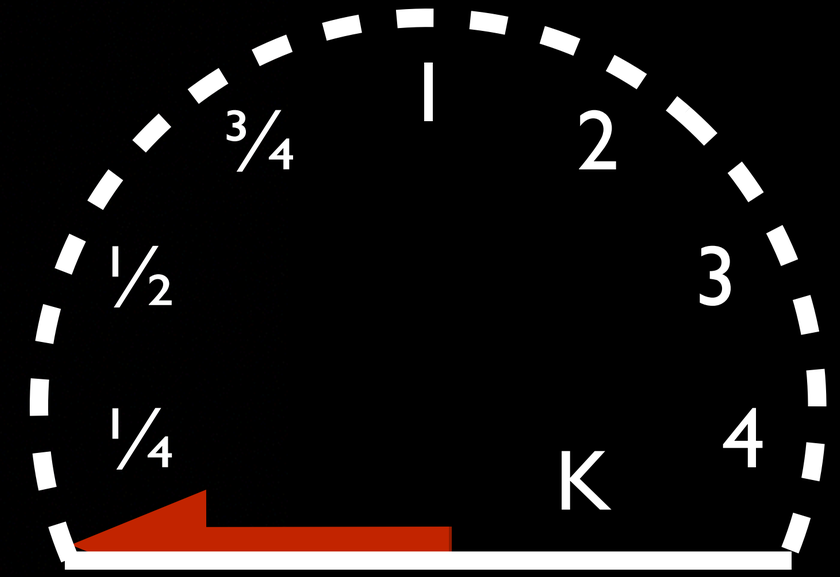

Reversible Reaction
Reactants
Products
K
Time
Equilibrium

A





$$K = \frac{[\text{products}]}{[\text{reactants}]}$$

Reactants ⇋ Products

$$aA + bB \rightleftharpoons cC\ dD$$

$$K = \frac{[products]}{[reactants]} \qquad K = \frac{[C]^c[D]^d}{[A]^a[B]^b}$$

$$2NO(g) + 2H_2(g) \rightleftharpoons N_2(g) + 2H_2O(g)$$

$$K = \frac{[N_2][H_2O]^2}{[NO]^2[H_2]^2} \qquad K = \frac{[products]}{[reactants]}$$

$$aA + bB \rightleftharpoons cC\ dD$$

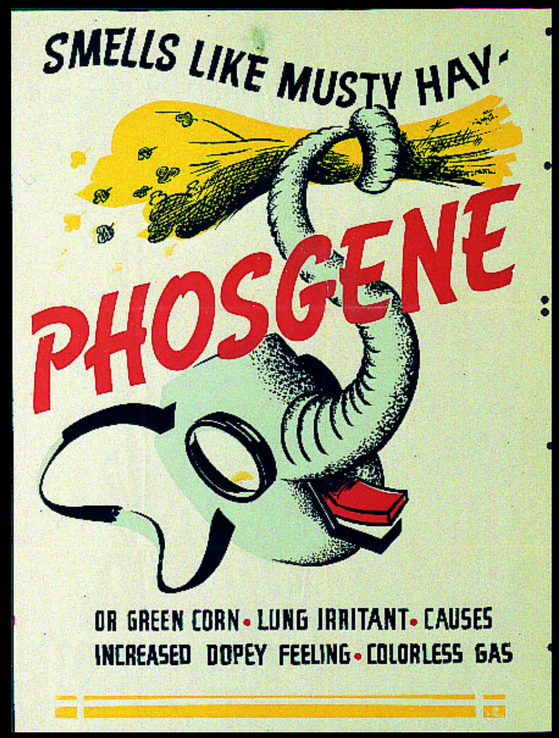
$$K = \frac{[C]^c[D]^d}{[A]^a[B]^b}$$

$K_c = 4.57 \times 10^9$ at 25°C

$K_c = .05$ at 200°C

$$CO(g) + Cl_2(g) \rightleftharpoons COCl_2(g)$$

$$K = \frac{[COCl_2]}{[CO][Cl_2]}$$



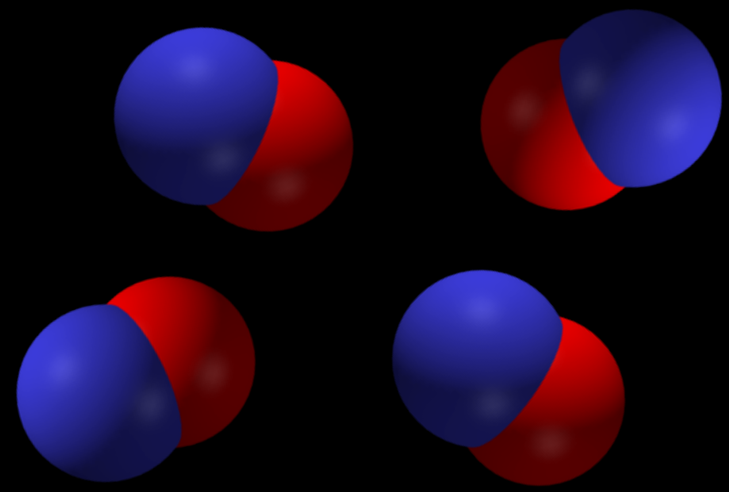
$$aA + bB \rightleftharpoons cC\ dD$$

$$K = \frac{[C]^c[D]^d}{[A]^a[B]^b}$$

$K_c = 1.0 \times 10^{-30}$
at 25°C

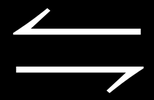
$$N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$$

$$K = \frac{[NO]^2}{[N_2][O_2]}$$



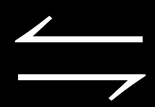
K>>1

Reactants



Products

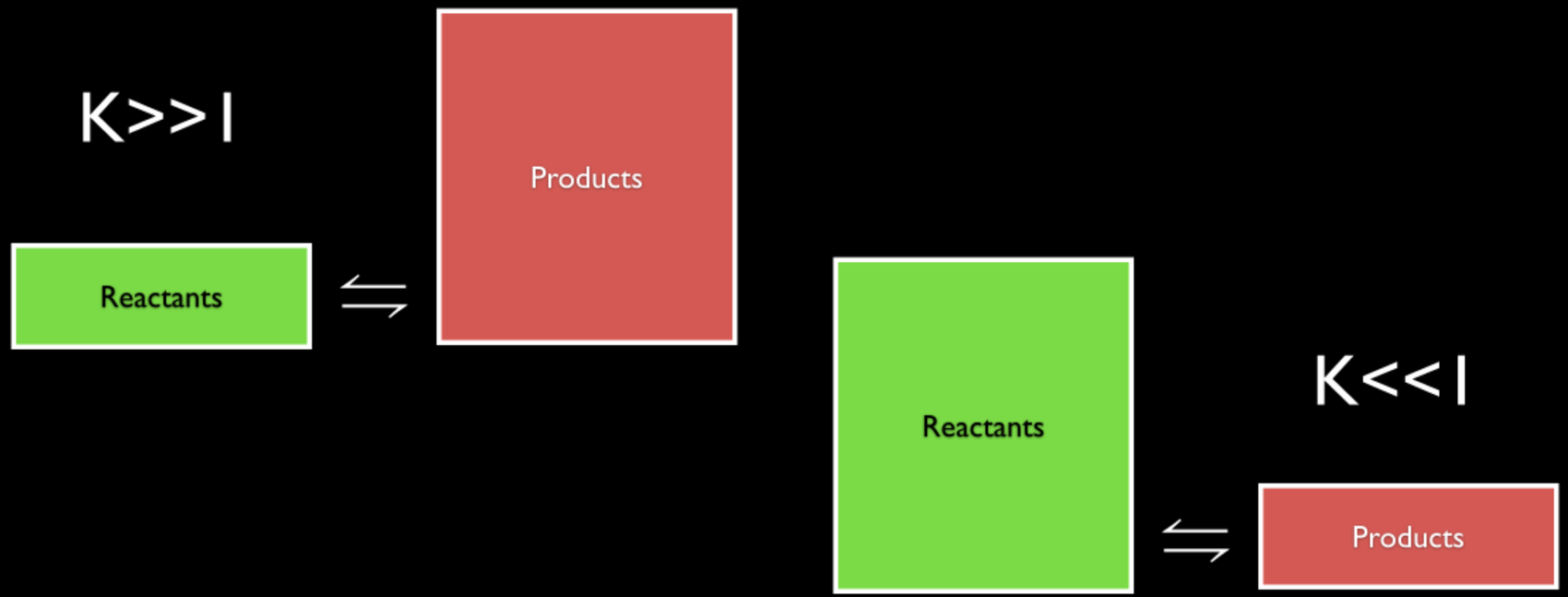
Reactants



K<<1

Products

Did you learn?



To use the value of K in a reversible reaction to determine which chemicals will have very large versus very small concentrations at equilibrium.

Acknowledgements

"File:Lightning Hits Tree.jpg," January 2, 2014. http://en.wikipedia.org/wiki/File:Lightning_hits_tree.jpg.
"File:Nitric-Oxide-3D-vdW.png," January 2, 2014. http://en.wikipedia.org/wiki/File:Nitric-oxide-3D-vdW.png.
"File:Phosgene Poster ww2.jpg," January 2, 2014. http://en.wikipedia.org/wiki/File:Phosgene_poster_ww2.jpg.
"Reversible Reactions." *PhET*, January 2, 2014. http://phet.colorado.edu/en/simulation/reversible-reactions.

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