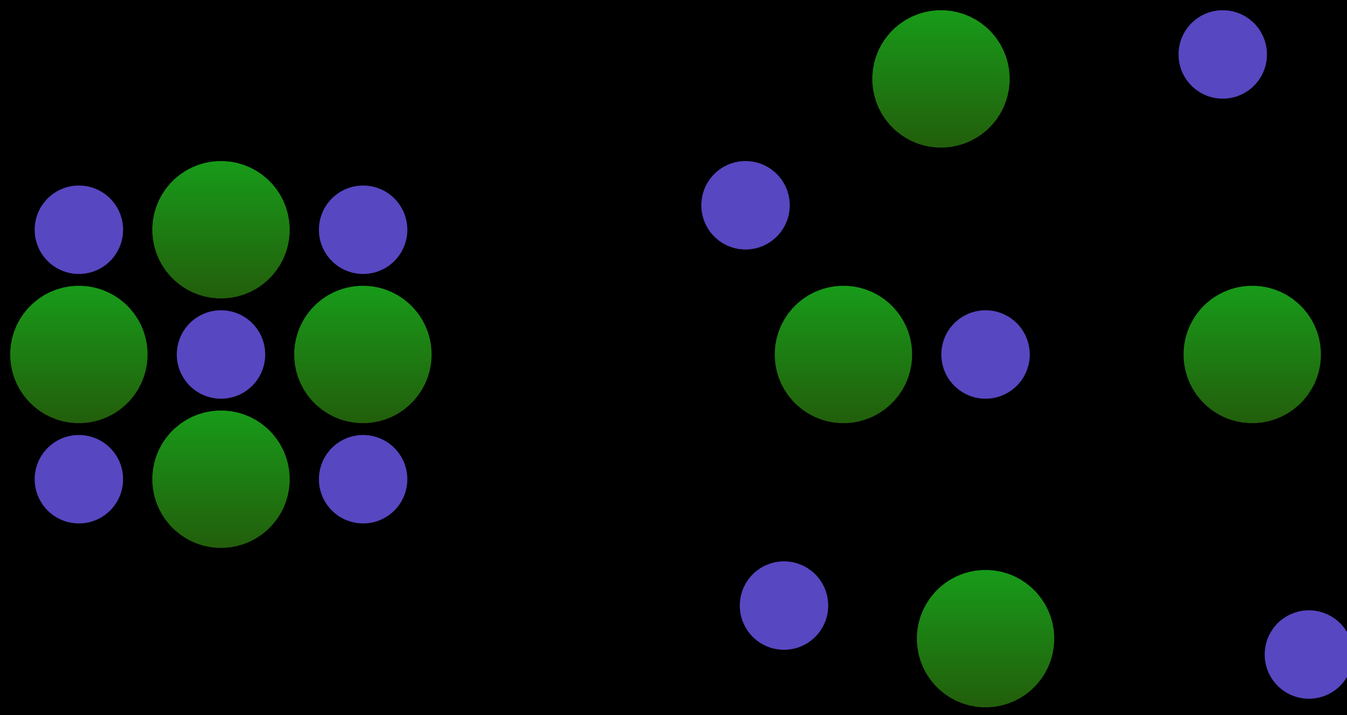
Solubility



Chemistry Essentials - 070

Solution

Dissolution

Reversible reaction

Equilibrium constant

K_{sp}

Solubility

Solubility-product constant

Solvent

s o l u t e

ΔG°

pH

Water

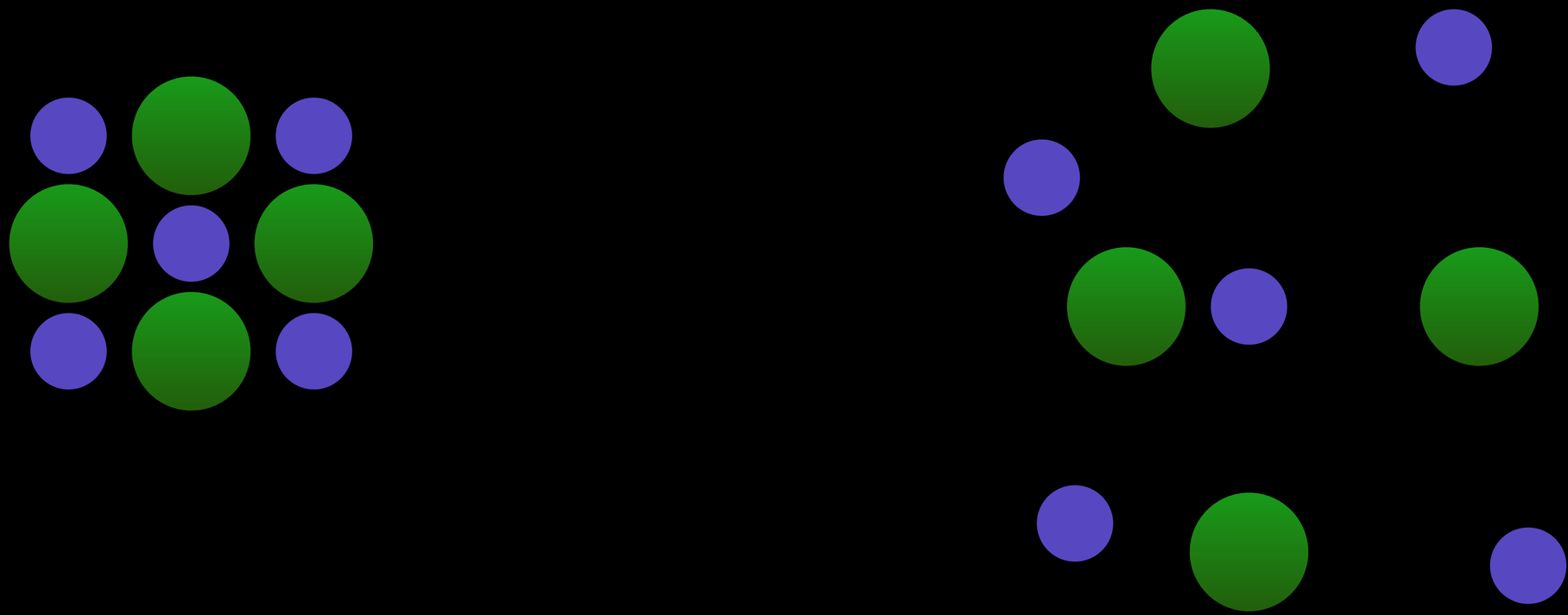
K^+

NO_3^-

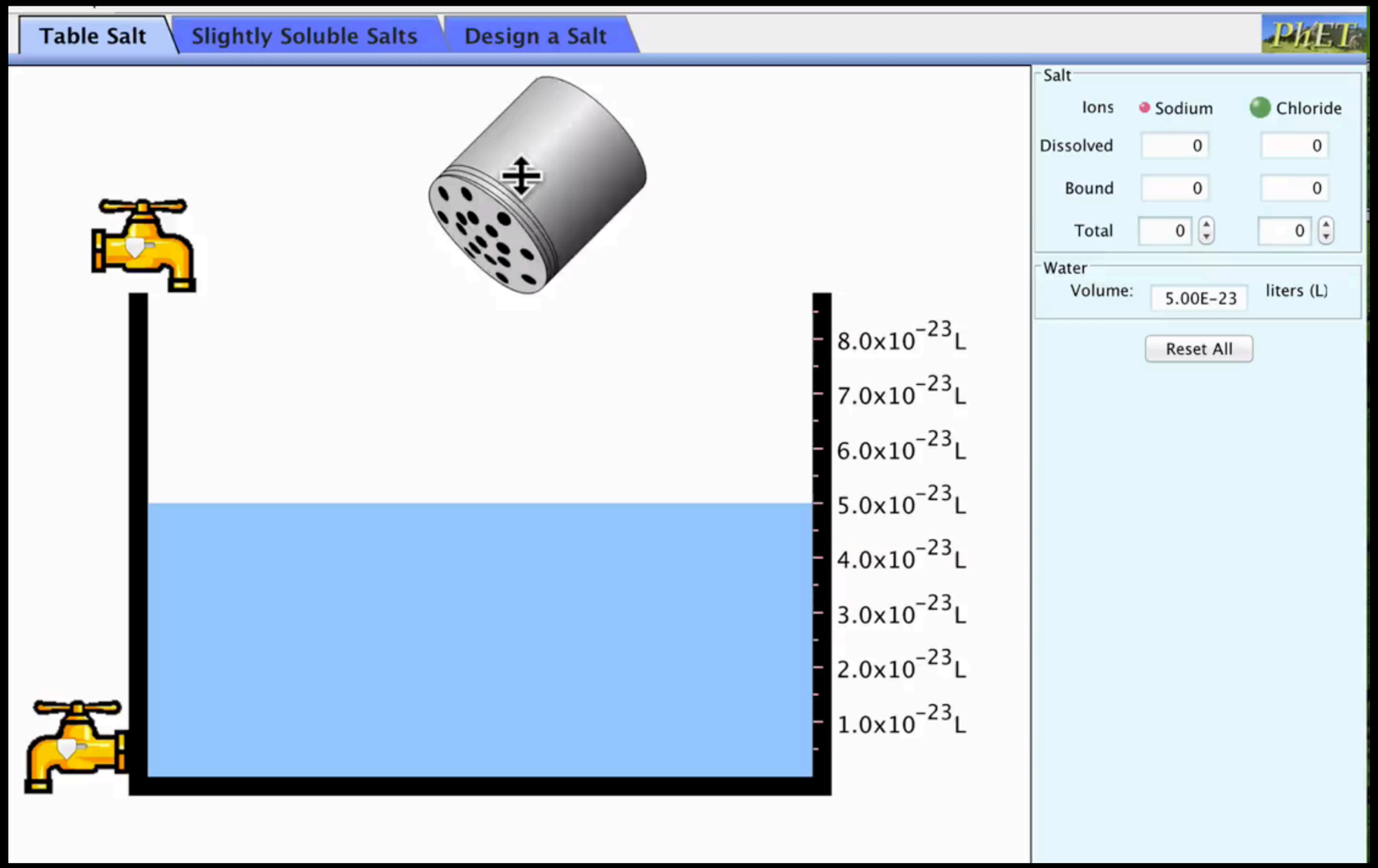
NH_4^+

Na^+

$$NaCl(s) \rightleftharpoons Na^{+}(aq) + Cl^{-}(aq)$$

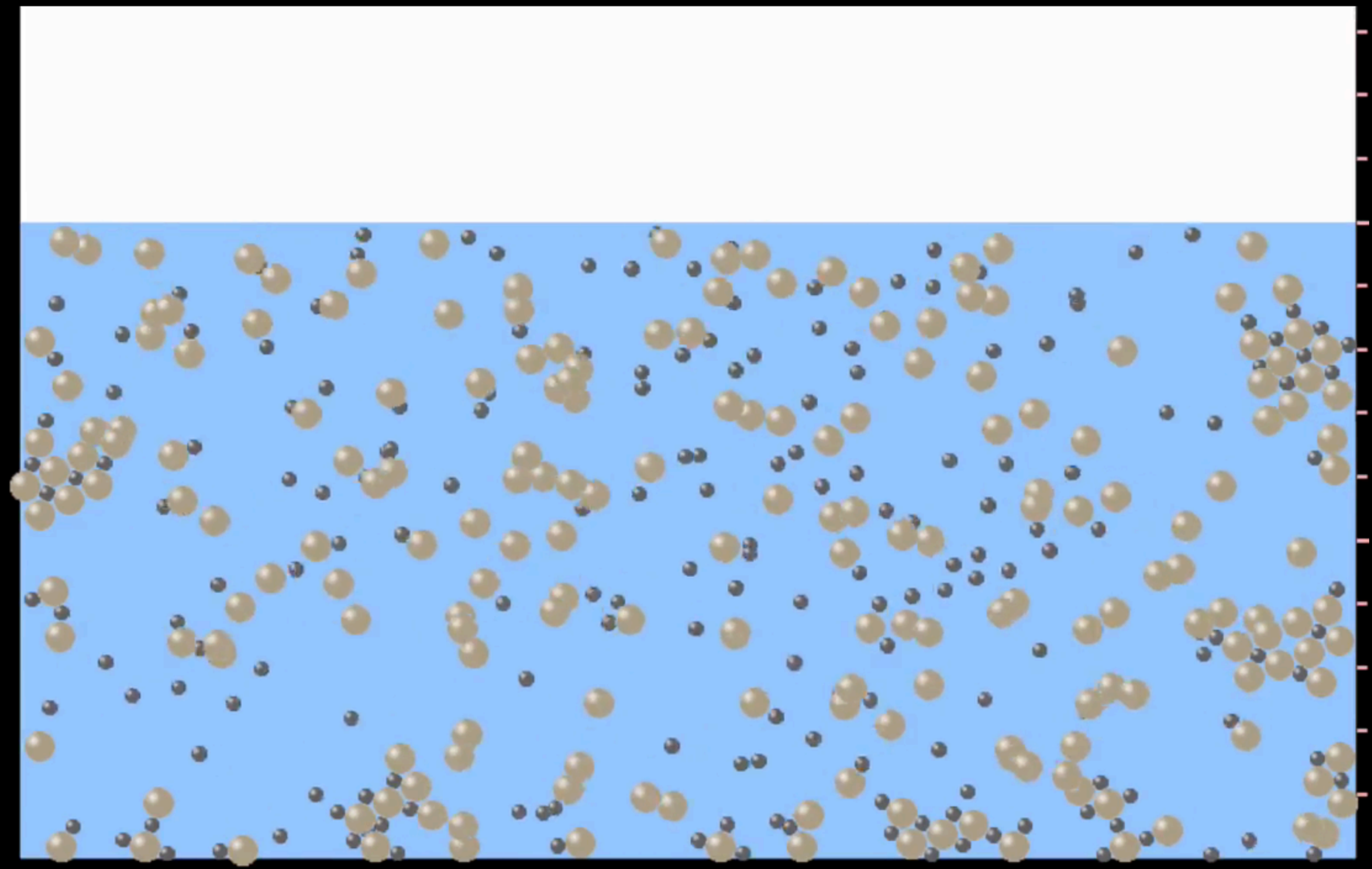


$NaCl(s) \rightleftharpoons Na^{+}(aq) + Cl^{-}(aq)$



http://phet.colorado.edu/en/simulation/soluble-salts

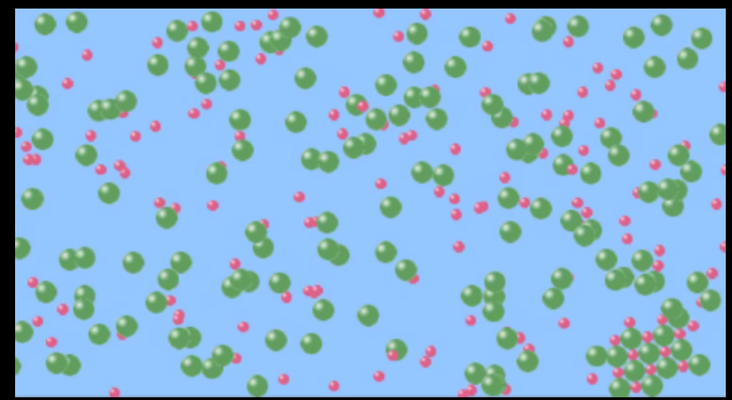
$$AgBr(s) \rightleftharpoons Ag^{+}(aq) + Br^{-}(aq)$$



http://phet.colorado.edu/en/simulation/soluble-salts

$$NaCl(s) \rightleftharpoons Na^{+}(aq) + Cl^{-}(aq)$$

$$K_{sp} = \frac{[Na^{+}][Cl^{-}]}{[NaCl]}$$



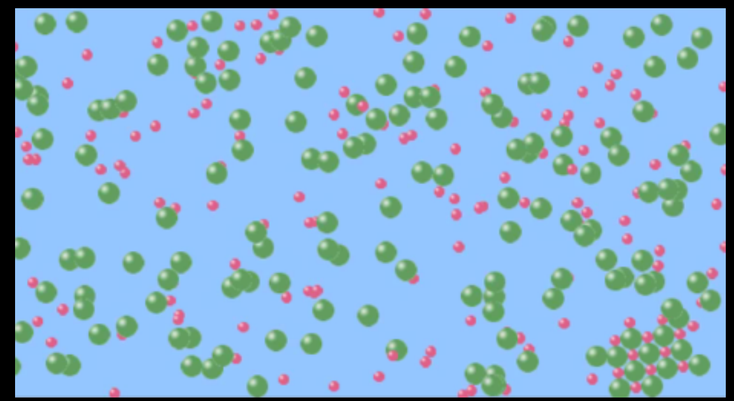
$$K_{sp} = [Na^{+}][Cl^{-}]$$

37.3 at 25°C

$$NaCl(s) \rightleftharpoons Na^+(aq) + Cl^-(aq)$$

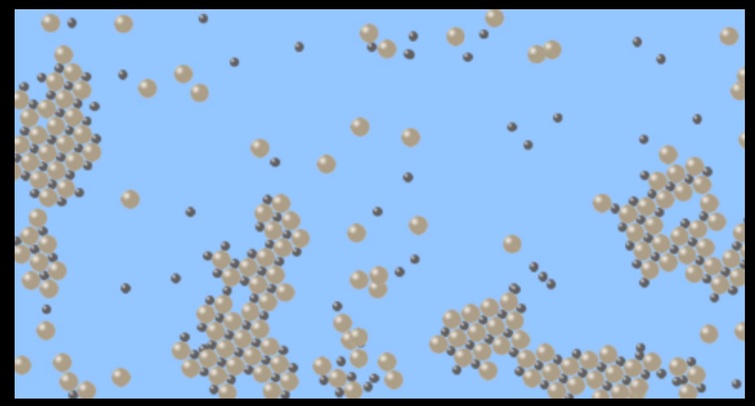
$$K_{sp} = [Na^+][Cl^-]$$

37.3 at 25°C



$$K_{sp} = [Ag^+][Br^-]$$

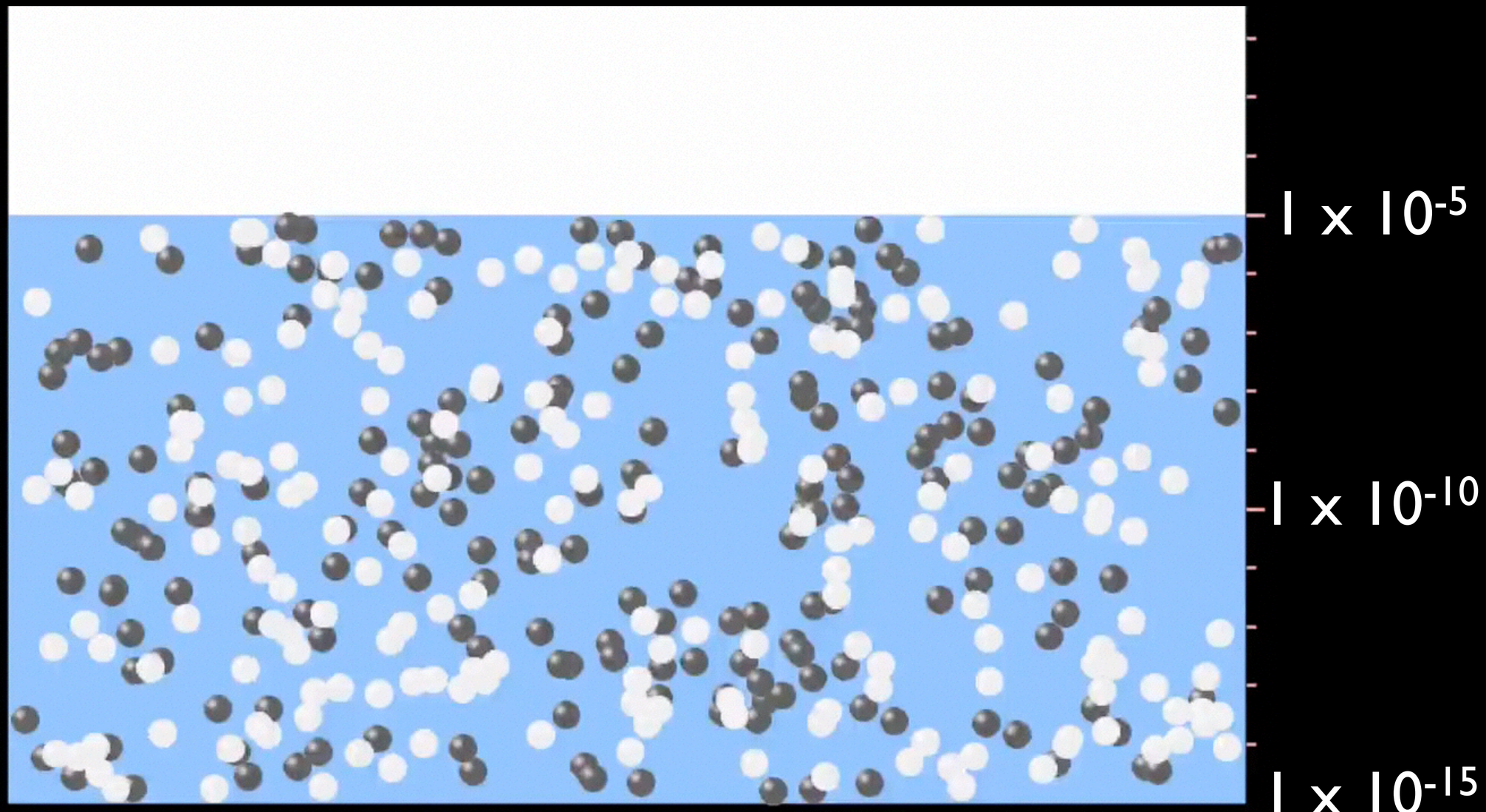
5.35×10^{-13}



Theoretical Salt

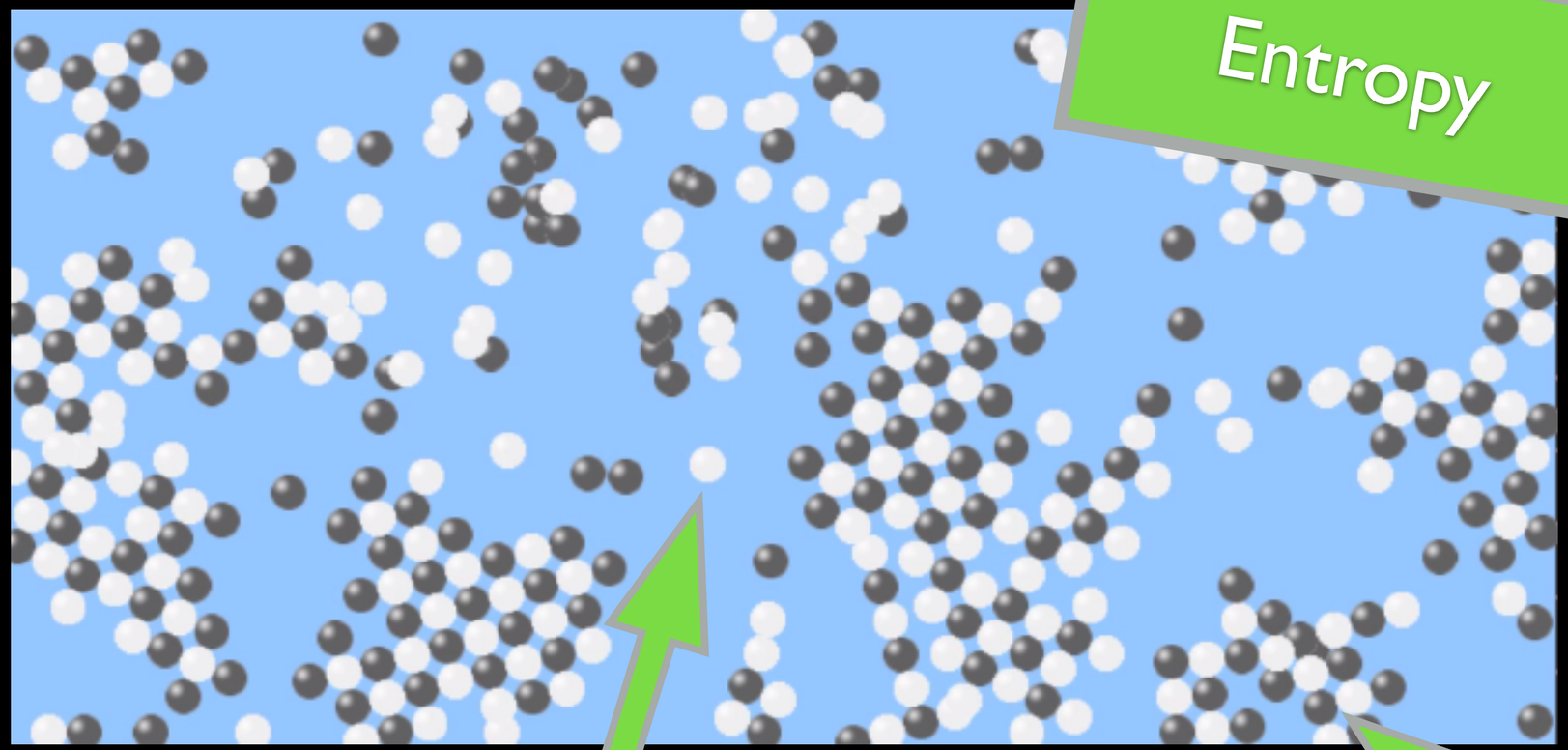
K_{sp}

1×10^{0}



http://phet.colorado.edu/en/simulation/soluble-salts

What affects K_{sp}?



Entropy

$\Delta G°$

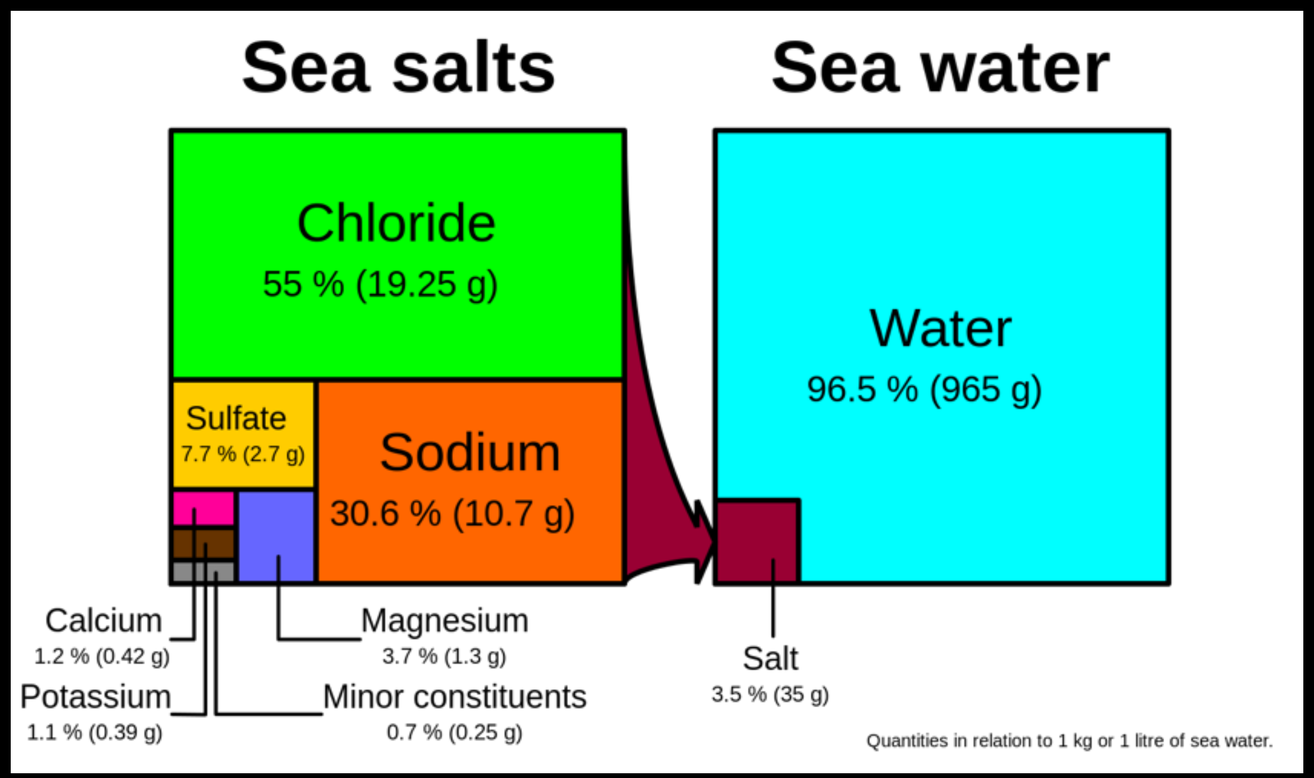
solvent interactions

common ions

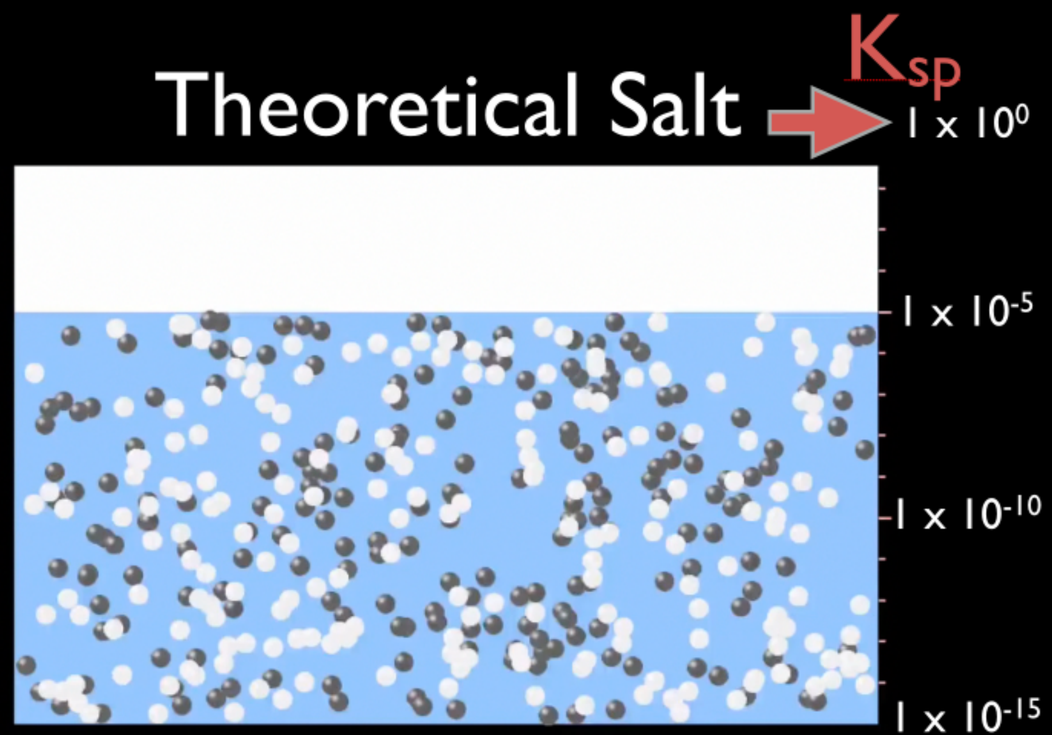
pH

solid forces

Applications



Did you learn?



To predict the solubility of a salt, or rank the solubility of salts, given the relevant K_{sp} values.

Did you learn?

$$K_{sp} = [Na^+][Cl^-]$$

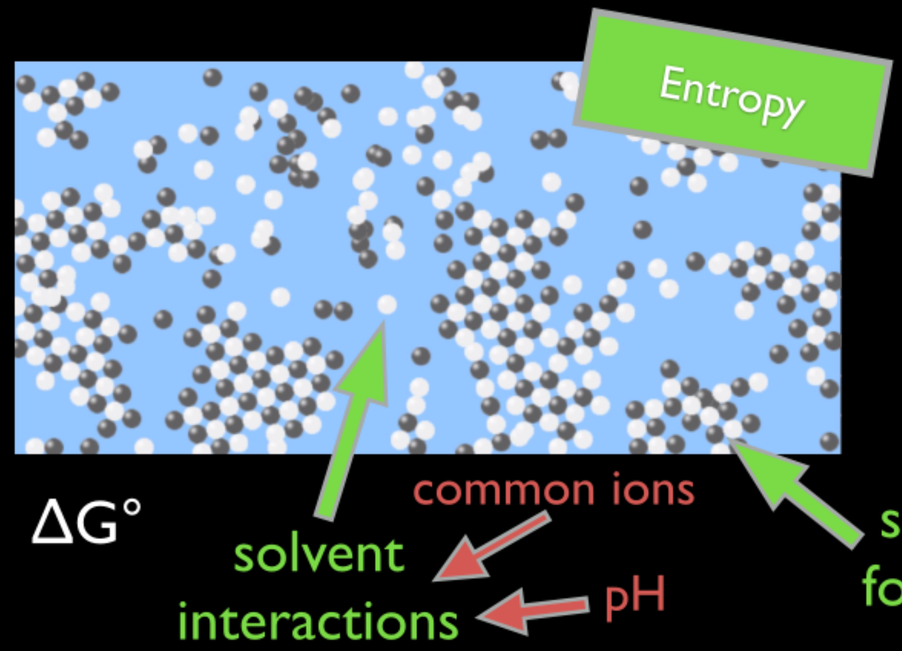
37.3 at 25°C

$$K_{sp} = [Ag^+][Br^-]$$

5.35×10^{-13}

To interpret data regarding the relative solubility of salts in terms of factors that influence the solubility.

Did you learn?



To analyze the enthalpic and entropic changes associated with the dissolution of a salt, using particulate level interactions and representations.

Acknowledgements

2004, Picture taken by me-- Chris 73 14:12, 11 Dec. *English: Solution of Salt in Water (regular Table Salt, Regular Tap water)Esperanto: Salo Solviĝanta En akvoPolski: Sól Rozpuszczana W wodzieРусский: Растворение Соли В Воде*, [object HTMLTableCellElement]. Licensing: This image was created by Chris 73. The image is licensed under a dual license; please choose either of the two licenses below as desired. Attribution to Wikipedia or another project of the Wikimedia foundation is required for both licenses if the image is used outside of projects of the Wikimedia foundation. Attribution to me is not required. Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.3 or any later version published by the Free Software Foundation; with no Invariant Sections, no Front-Cover Texts, and no Back-Cover Texts. A copy of the license is included in the section entitled GNU Free Documentation License. www.gnu.org/licenses/fdl-1.3.htmlGFDL 1.3GNU Free Documentation License 1.3truetrue This file is licensed under the Creative Commons Attribution-Share Alike 3.0 Unported license. Attribution: Chris 73 / Wikimedia Commons You are free: to share – to copy, distribute and transmit the work to remix – to adapt the work Under the following conditions: attribution – You must attribute the work in the manner specified by the author or licensor (but not in any way that suggests that they endorse you or your use of the work). share alike – If you alter, transform, or build upon this work, you may distribute the resulting work only under the same or similar license to this one. http://creativecommons.org/licenses/by-sa/3.0 CC-BY-SA-3.0 Creative Commons Attribution-Share Alike 3.0 truetrue “I want to use the image. How do I do that?” You can use this image freely for any purpose, including commercial use, provided that you license it under one of the above licenses. My suggestion is to use the following text: This Wikipedia and Wikimedia Commons image is from the user Chris 73 and is freely available at //commons.wikimedia.org/wiki/File:SaltInWaterSolutionLiquid.jpg under the creative commons cc-by-sa 3.0 license. For privacy reasons please use only “Chris 73” as author. If necessary, please translate the text in your language. For electronic use please include the links in the text as shown, for printed use please print the text as shown. If you use the image I would appreciate it if you would let me know on my talk page, but this is not required as long as you follow one of the above licenses. http://commons.wikimedia.org/wiki/File:SaltInWaterSolutionLiquid.jpg.

“File:Pollution - Damaged by Acid Rain.jpg,” February 16, 2014. http://en.wikipedia.org/wiki/File:Pollution_-_Damaged_by_acid_rain.jpg.

“File:Sea Salt-E-Dp Hg.svg,” February 16, 2014. http://en.wikipedia.org/wiki/File:Sea_salt-e-dp_hg.svg.

“Salts & Solubility.” *PhET*, February 16, 2014. http://phet.colorado.edu/en/simulation/soluble-salts.

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