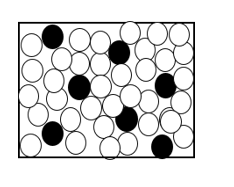
**Representing solutions**

Sugar is in the solid state at room temperature. It dissolves in water.

Ammonia is in the gas state at room temperature. It also dissolves in water.

****

1. Which solution or solutions could this particle diagram represent?

A Solution of sugar only

B Solution of ammonia only

C Neither

D Both

*Chemistry > Big idea CPS: Particles and structure> Topic CPS1: Substances and mixtures > Key concept CPS1.1: Particles in solutions*

|  |
| --- |
| **Response activity** |
| **Representing solutions** |

|  |  |
| --- | --- |
| Learning focus: | Understand how a particle model of matter can be used to describe and explain solutions. |
| Observable learning outcome: | Explain observations of dissolving using the particle model. |
| Activity type: | simple multiple choice |
| Key words: | particle, solution, dissolve |

This activity can help develop students’ understanding by addressing the sticking-points revealed by the following diagnostic questions:

* Dissolving ammonia

**What does the research say?**

Johnstone (1991) explains the difficulties that many students face in understanding science as the degree of ‘multilevel’ thought required. In chemistry students are frequently required to think about very different types of thing all at once.

Johnstone presented this in the form of a triangle:



*(after Johnstone, 1991, p78)*

Understanding how a student is mentally representing a solution can provide information on misunderstandings, especially regarding the dissolving of substances in the gas state.

There is no state of a solute in a solution so the particle diagram of a solution looks the same regardless of the initial state of the solute.

**Ways to use this activity**

Students discuss the choice of answer in small groups. Each member of the group should be able to explain the choice of answer.

**Expected answers**

D

**Acknowledgments**

Developed by Helen Harden (UYSEG) from an idea by Philip Johnson

Images: Helen Harden

**References**

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