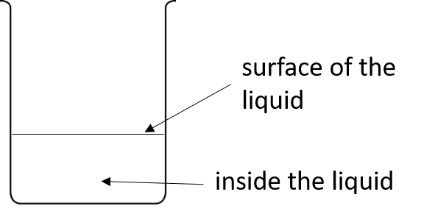
**Location of evaporation**

A liquid is added to a beaker.

The beaker is left.

Where does evaporation take place?

Put a tick (✓) in the box next to the best answer.

|  |  |  |
| --- | --- | --- |
| **A** | at the surface of the liquid |  |
|  |  |  |
| **B** | inside the liquid |  |
|  |  |  |
| **C** | everywhere in the liquid |  |
|  |  |  |

*Chemistry > Big idea CPS: Particles and structure > Topic CPS5: Evaporation > Key concept CPS5.1: Explaining evaporation*

|  |
| --- |
| **Diagnostic question** |
| **Location of evaporation** |

**Overview**

|  |  |
| --- | --- |
| Learning focus: | Evaporation takes place at any temperature between melting and boiling point. |
| Observable learning outcome: | Describe where in a liquid evaporation takes place. |
| Question type: | Diagnostic, simple multiple choice |
| Key words: | evaporation |

**What does the research say?**

As part of their research Coştu and Ayas (2005) presented situations to students through a series of short experiments. They then used questioning to discover more about students’ understanding.

One question used was “Does evaporation take place on the surface of the alcohol or in all parts of it? Why?”

A few students correctly explained that particles left from the surface of the liquid. All those that were identified to hold a “specific misconception” were found to think that evaporation occurs in all parts of a liquid.

**Ways to use this question**

Students should complete the question individually. This could be a pencil and paper exercise, or you could use an electronic ‘voting system’ or mini white boards and the PowerPoint presentation.

The answers to the question will show you whether students understood the concept sufficiently well to apply it correctly.

If there is a range of answers, you may choose to respond through structured class discussion. Ask one student to explain why they gave the answer they did; ask another student to explain why they agree with them; ask another to explain why they disagree, and so on. This sort of discussion gives students the opportunity to explore their thinking and for you to really understand their learning needs.

**Expected answers**

A

**How to respond - what next?**

A student who selects option B may be confusing evaporation with the formation of bubbles of a substance in the gas state during boiling. Selection of option C could indicate a similar misunderstanding. It also suggests misunderstandings about the mechanism of evaporation at the particle level.

If students have misunderstandings about where evaporation takes place you may wish to challenge thinking through an experiment to find the effect of surface area on rate of evaporation.

The following BEST ‘response activity’ could be used in follow-up to this diagnostic question:

* Surface area

**Acknowledgments**

Developed by Helen Harden (UYSEG), from an idea by Bayram Coştu and Alipaşa Ayas.

Images: Helen Harden and Alistair Moore (UYSEG)

**References**

Coştu, B. and Ayas, A. ş. a. (2005). Evaporation in different liquids, secondary students' conceptions. *Research in Science and Technological Education,* 23(1)**,** 75-97.