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Posted by Anonymous on Tue, 2014-05-06 23:34

Supply of boiling beads or chips: Just wondering if you know from where I can purchase some *boiling beads or chips* - as opposed to Marble Chips which are unstable when heated and thus unsuitable for distillation activities.

We have always used broken pieces of crucible or evaporating basins; I have the impression that there is something better out there somewhere for the purpose.

Voting:



Average: 5 (1 vote)

Year Level:

7
8
9
10

Senior Secondary

Laboratory Technicians:

Laboratory Technicians

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Answer by ginny.r.ward on question Boiling Beads or Chips

Submitted by sat on 18 August 2014

Answer reviewed 8 February 2023

Clean broken pieces of crucible or evaporating basins are quite acceptable to be used as boiling chips to reduce bumping when boiling liquids. You are correct that marble chips (calcium carbonate) are unsuitable for using as boiling chips.

There is no reason to purchase commercial products for school purposes. However, if you are looking to purchase commercial products, they are also called anti-bumping granules and are available through scientific suppliers.

Boiling chips are small unevenly shaped pieces made from porous material containing cavities or from material which has a coarse, uneven surface. One or two boiling chips are added to a cool liquid which is to be heated. The rough surface or cavities in the boiling chips act as nucleation sites for the formation of bubbles. Bubbles disperse through the liquid, agitating it and allowing the liquid to vaporise in a controlled manner. The liquid is thus prevented from superheating which can result in the liquid 'bumping' or shooting uncontrollably out of the vessel.

It is important to remember that boiling chips should not be added to a hot liquid. This can result in a violent release of energy, and expulsion of hot liquid from the vessel.

For school purposes, ceramic chips are sufficient as boiling chips. Some people use glass beads, which are also suitable, as long as they have a rough and not a smooth surface. Commercially available 'anti-bumping granules', porous granules made from aluminium oxide, Al_2O_3 , can also be purchased.

"Practical skills in Chemistry"¹ recommends the following 'anti-bumping' measures:

1. Add one or two 'boiling stones' or 'anti-bumping granules'; these can be filtered off later in the process.
2. Add a Pyrex glass rod to the beaker or conical flask. The rod must be longer than the container so that it can be removed and rinsed before the solution is used further.
3. Add a 'boiling stick': these are thin pieces of wood sold as 'wooden applicator', but you must be sure that nothing will be extracted from the wood into your solution.

Reference

¹ Dean, J. R., Jones, A. M., Holmes, D., Reed R., Jones, A., Weyers, J. (2011) "Practical Skills in Chemistry", Second Edition, Pearson Education Limited, England.