**Heat of Vaporization**

New Regents original practice • Name: _____ Date: _____
Show your work for written answers.

Use q = mHv for vaporization at the boiling point. For water in this worksheet, Hv = 2,260 J/g and liquid water's specific heat is 4.18 J/(g·°C).

**1** How much heat vaporizes 2.00 g of water at its boiling point?

(1) 1,130 J

(2) 2,260 J

(3) 4,520 J

(4) 9,040 J

**2** A water sample absorbs 11,300 J as it vaporizes at its boiling point. Calculate the vaporized mass. [1]

Answer and work

_____

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**3** Which process releases heat from a water sample at its boiling point?

(1) Vaporization of liquid water

(2) Condensation of water vapor

(3) Warming of liquid water

(4) Melting of ice

**4** Explain what the added heat does while a pure liquid is boiling at fixed pressure and constant temperature. [1]

Answer and work

_____

_____

**Heating Samples at 1 atm**

Use the information below to answer the questions.

Each run uses 10.0 g of water at 1 atm, with negligible energy loss. The boiling point is 100.0 °C. Use Hv = 2,260 J/g and a liquid specific heat of 4.18 J/(g·°C).

| Run | Initial temperature (°C) | Energy supplied (J) |
|---|---|---|
| P | 100.0 | 11,300 |
| Q | 100.0 | 22,600 |
| R | 90.0 | 418 |

**5** Which run receives just enough energy to vaporize all 10.0 g?

(1) P

(2) Q

(3) R

(4) All three

**6** How much water vaporizes in run P? Show how you use the heat of vaporization. [1]

Answer and work

**7** Use the supplied energy to explain why run R can reach 100 °C but has no energy left for vaporization. [1]

Answer and work

**8** If the 5.00 g of vapor from P condenses at the boiling point, how much heat does it release?

(1) 2,260 J

(2) 4,520 J

(3) 11,300 J

(4) 22,600 J