**Videos 14E-Calorimetry Name**

Heat lost by hot stuff = heat gained by cold stuff

Example 1: A 0.231 kg piece of unknown substance at 98 oC is dropped into 0.481 kg of water at 18 oC. The final temperature of the water is 32 oC. What is the specific heat of the substance? (neglect the calorimeter cup, and assume no heat is lost to the surroundings) (cwater = 4186 JoC-1kg-1) (1800 JoC-1kg-1 )

Example 2: A 0.250 kg piece of iron at 95.0 oC is dropped into 0.512 kg of water at 18.0 oC. What is the final equilibrium temperature? (neglect the calorimeter cup, and assume no heat is lost to the surroundings)

(cwater = 4186 JoC-1kg-1,cFe = 450. JoC-1kg-1) (21.8 oC )

Whiteboards: (These are solved on the website in the videos linked after the main one)

|  |  |
| --- | --- |
| 1. 0.112 kg of a mystery substance at 85.45 oC is dropped into 0.873 kg of water at 18.05 oC in an insulated Styrofoam container. The water and substance come to equilibrium at 23.12 oC. What is the c of the substance? (cwater = 4186 JoC-1kg-1) (2650 JoC-1kg-1) | 2. A chunk of Mippsalipsium at 68.1 oC is dropped into 0.625 kg of water at 21.1 oC in a .257 kg Aluminum calorimeter. The water, Aluminum, and Mippsalipsium come to equilibrium at 25.2 oC. What is the mass of the Mippsalipsium? (0.125 kg)(cwater = 4186 JoC-1kg-1, cAl = 900. JoC-1kg-1, cMi = 2174 JoC-1kg-1) |
| 3. 52 grams of glass at 91.1 oC is dropped into 154 g of water at 25.1 oC in an insulated Styrofoam container. What will be the final equilibrium temperature if no heat is lost to the surroundings? (29 oC)(cwater = 4186 JoC-1kg-1, cglass = 840 JoC-1kg-1) | 4. 127 grams of copper at 99.5 oC is dropped into 325 g of water at 23.6 oC in a 562 g glass beaker. What will be the final equilibrium temperature if no heat is lost to the surroundings? (25.6 oC )(cwater = 4186 JoC-1kg-1, cglass = 840 JoC-1kg-1, cCu = 390 JoC-1kg-1) |