# $E_h$ Problems of Object Immersion

- Often when working with the energy of heat, a hotter object will be immersed into a medium that is cooler. Ultimately the energy from the hotter object will flow into the cooler object until the overall temperature of both is equal. In these types of problems one needs to realize that the energy being lost from one of the objects is being absorbed by the other. Therefore the overall energy change of the **system** is ZERO!! If this is true then I can set up an equation of the $E_h$ of both items being equal to zero and then substitute what is given to solve for my unknown.

<u>Ex.</u> - A 0.500 kg mass of carbon ($c = 710\frac{J}{kg}\,^oC$) at 50 °C is placed in 1.00 kg of mercury ($c = 140\frac{J}{kg}\,^oC$) at 80 °C. What will the final temperature of the mixture be?

    Answer -

<u>Ex.</u> – A 5.00 kg mass of carbon ($c = 710\frac{J}{kg}K$) at 373 K is placed in 1.00 kg of water ($c = 4180\frac{J}{kg}K$) at 293 K . What will the final temperature of the mixture be?

    Answer –