Extra calorimetry problems for practice:

1. What is the specific heat of an unknown metal if the temperature of a 28.4 g sample is increased by 8.1°C when 207 J of heat is added? What is a possible identity for this metal? **(900 J/kgK)**
2. How much heat is needed to raise the temperature of a 3.25 kg nugget of silver by 55.0°C? **(42.9 kJ)**
3. If 245 J of heat is added to 154 g of iron at 20.0°C, what is the new temperature for the iron sample? **(23.5°C)**
4. How much heat is needed to completely melt 250.0 g of ice initially at –7°C? **(87.4 kJ)**
5. How much energy is needed to raise the temperature of a 20.4 g sample of water from 47.0°C to 152.0°C? **(52.8 kJ)**
6. 396 kJ are added to a block of ice to raise it from -22.0°C to 55.0°C. What is the mass of the water/ice sample? **(647g)**
7. A 150. g sample of gold was heated to 300.0°C and then dropped into a beaker containing 50.0 g of water at room temperature (25.0°C). The temperature of the water in the beaker quickly rose to 45.0°C. What is the specific heat capacity for gold? **(109 J/kgK)**
8. A 0.125 kg sample of water was heated to 100.0°C and then a bar of platinum at 20°C was dropped into the beaker. The temperature of the platinum in the beaker quickly rose to 35.0°C. The specific heat of platinum is 130 J/kgK. What is the mass of the platinum bar? **(17.4 kg)**
9. **What would be the final temperature if 0.1350 kg of water at 90.0°C is added to 0.0630 kg of water at 20.0°C in a 250 g aluminum calorimeter? (57.5°C)**
10. **What would be the final temperature if a 2.35 kg piece of lead at 210°C is inserted in a 250 g aluminum calorimeter with 10.2 kg of water at 50.0°C ? (51.1°C)**
11. (Challenge problem) 25.0 kg of liquid lava (c = 840 J/kgK) at 1520°C flows into the 35°C water surrounding a volcanic island, vaporizing the water into a beautiful display of steam at 100°C. What mass of water is vaporized as the lava solidifies (Lf = 418.6 kJ/kg at 1170°C) and then cools to 35°C? (Let heat capacity of igneous rocks = 1970 J/kgK and assume all heat from the lava is used to vaporize water.) **(29.1 kg)**