Coke Can Lab

Name _____
Date _____ Period _____

Procedure:

1. Measure volume of coke can. _____ cubic meters (m^3)

2. Place 1 – 2 tablespoons of water into otherwise empty aluminum coke can.

3. Place the can on the hot plate, turned on high. Heat water until steam appears.

4. Wait about 30 seconds after steam appears. Then, as quickly as possible, place the can into the cold water bath with the hole facing down. What happens? Why does the hole have to be down?

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5. Record the new volume of the can _____ cubic meters (m^3)

6. Record Temperature of cold water bath _____ ^{O}K

7. What should happen to the temperature of the cold water bath before and after the can is dunked in the cold water?

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8. What should the temperature of the steam have been just before the cold water dunking? _____ ^{O}K

9. For the gas in the can, Calculate:

$$Q = 2260\ KJ/Kg \times 220 Kg\text{-}K/m^3 \times \frac{\text{change volume steam } (m^3)}{\text{Initial temp. Steam } (^{O}K)} \quad \_\_\_\_\_\ J$$

$W = p \times \text{delta } V =$ _____ J

$U = Q - W =$ _____ J

10. What happens to the delta S (change in entropy) for the steam in the can? What about delta S fro the system?

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11. If you could make a heat engine out of this system, what would be the Carnot efficiency?

$(T_h - T_c) / T_h \times 100\% =$ _____ %