Quiz Ch18-1

Date: 2/11 /2016

Name: ID#: Sec#:

A certain substance has a mass per mole of 50.0 g/mol. When 314 J is added as heat to a 30.0 g sample, the sample’s temperature rises from 25.0 C to 45.0 C. What are the (a) specific heat and (b) molar specific heat of this substance? (c) How many moles are in the sample?

$$M\_{sample}=30g=0.03 kg$$

$$Molar mass=50g=0.05 kg$$

$$n=\frac{M\_{sample}}{M}=\frac{30}{50}=06$$

$$∆T=20 K$$

$$Q=mc\_{m}∆T ⟹ c\_{m}=\frac{Q}{m∆T}=\frac{314}{0.03×20}= 523.3 \frac{J}{kg.K}$$

$$Q=nc\_{n}∆T ⟹ c\_{n}=\frac{Q}{n∆T}=\frac{MQ}{m∆T}=M\frac{Q}{m∆T} ⟹ c\_{n}=Mc\_{m}$$

$$ c\_{n}=Mc\_{m}=0.05×523.3= 26.2 \frac{J}{mol.K}$$

Another way:

$$Q=nc∆T ⟹ c=\frac{Q}{n∆T}=\frac{314}{0.6×20}= 26.2 \frac{J}{mol.K}$$