Penentuan Tetapan Kalorimeter

1. Panaskan minimal 30 mL air keran dalam gelas kimia menggunakan hotplate hingga mencapai suhu ±55 oC.
2. Masukkan 25 mL air keran dingin ke dalam kalorimeter, lalu ukur suhunya.
3. Ambil 25 mL air keran yang telah dipanaskan, lalu ukur dengan pasti suhu air panas yang telah dituang tersebut.
4. Dinginkan thermometer dengan cara mencelupkan ujungnya ke dalam air keran dingin.
5. Campurkan 25 mL air panas dengan air dingin dalam kalorimeter, lalu segera tutup kalorimeter. Pada saat yang sama, nyalakan stopwatch.
6. Lakukan pengadukan campuran dalam kalorimeter dengan cara menggoyang kalorimeter (hati-hati jangan sampai air dalam kalorimeter tumpah). Catat suhu campuran dalam kalorimeter setiap 10 detik hingga total waktu 90 detik, lalu lanjutkan pencatatan dengan interval 30 detik hingga total waktu 5 menit.
7. Tentukan suhu maksimum yang tercapai, lalu tentukan tetapan kalorimeter (C) dengan persamaan:

$$q\_{lepas}=q\_{serap}$$

$$m\_{p}×c\_{air}×\left(T\_{p}-T\right)=m\_{d}×c\_{air}×\left(T-T\_{d}\right)+C×\left(T-T\_{d}\right)$$

mp = massa air panas

md = massa air dingin

Tp = suhu air panas

Td = suhu air dingin

T = suhu maksimum yang tercapai setelah pencampuran

cair = kalor jenis air

Determining Calorimeter’s Constant

1. Heat at least 30 mL of tap water in a beaker glass on a hotplate until it reaches ±55 oC.
2. Add 25 mL of cold tap water into the calorimeter, then measure its temperature.
3. Take 25 mL hot water, then measure its temperature after it has been poured.
4. Cool the thermometer by dipping it into cold water.
5. Mix the hot water with the cold one within the calorimeter, then close the lid. At the same time, start measuring elapsed time using stopwatch.
6. Shake the calorimeter gently, careful not to spill its content. Measure the temperature of the water inside every 10 seconds for 90 seconds, then continue taking note at 30 seconds interval for a total of 5 minutes.
7. Determine the maximum temperature obtained, then calculate calorimeter’s constant using the following equation:

$$q\_{released}=q\_{absorbed}$$

$$m\_{h}×c\_{w}×\left(T\_{h}-T\right)=m\_{l}×c\_{w}×\left(T-T\_{l}\right)+C×\left(T-T\_{l}\right)$$

mh = mass of hot water

md = mass of cold water

Th = temperature of hot water

Td = temperature of cold water

T = maximum temperature measured

cw = specific heat of liquid water

s