CALORIMETER DOUBLE WALL

CAT NO. PH0454A

Instruction Manual

Density and Specific Heat Values for some Common Metals Including this Set:

Material	*Density (g/cm^3)*	*Specific Heat ($J/g.^\circ C$)*
Brass	8.44-8.75*	0.385*
Lead	11.3	0.13
Iron	7.87	0.45
Copper	8.96	0.39
Aluminum	2.70*	0.91
Zinc	7.14	0.39
Tin	7.26	0.21
Silver	10.5	0.23
Steel	7.85	0.12
Gold	19.3	0.13
Water	1.000 g/cm^3 (at 4^0C)	4.186
	*These values can change based on how the metal is made	

REQUIRED COMPONENTS (INCLUDED)

Name of Part	*Quantity*
Outside Cup	1
Orange Rubber Stopper with Temperature Probe hole	1
Plastic lid with resistor and leads	1
Inside aluminum cup	1
Insulating Styrofoam ring	1
Stirring ring	1
Plastic ring to hold inside cup in place	1

REQUIRED COMPONENTS (NOT INCLUDED)

Name of Part	*Quantity*
Distilled water	200 mL
Thermometer or temperature probe	1
Balance (digital or triple beam)	1
Glycerol	1

RECOMMENDED COMPONENTS (NOT INCLUDED)

Name of Part	*Quantity*
Assorted metal samples	several
Tongs for transferring metals	1
Beaker	1
Hot plate	1
Voltmeter	1
Ammeter	1
Power supply DC	1
Connecting leads	5
Stop watch	1

SAFE HANDLING OF APPARATUS:

SAFETY EQUIPMENT REQUIRED:

Safety goggles and lab coat are required while using chemicals or handing boiling water. Gloves may be necessary for handing hot metal or chemicals. Follow all standard laboratory safety procedures while conducting your experiments.

Warning:

Some chemicals are dangerous to put into your calorimeter. For example HNO3 will react with the copper to produce NO, which is toxic. Make sure when doing heat of reaction experiments that neither products nor reactants will react with the copper in your calorimeter.

The resistor gets very HOT. Do not connect resistor to the circuit while it is outside of the water. Make sure resistor is cooled before handling.

MAINTENANCE REQUIRED:

Wash and dry all equipment after use. Store calorimeter in a dry place so the aluminium does not oxidize.

Before performing experiments that do not use the electric resistor, remove the spring by unscrewing the two nuts at the end of the heating unit and gently pulling the spring out. This will prevent the spring from being damaged while other materials besides liquids are introduced to the calorimeter.

DIAGRAM LABELING ALL PARTS: