

LAD C.1 Specific Heat Capacity of Metals

Per 1

identity of metal	Al(cube)	Al(cyl)	Cu(cube)	Cu(cyl)	Zn	Sn	Pb
mass of water (g)	130.76	180.33	129.64		148.02	117.21	89.44
start temp of water °C	23	22.3	22.5		22.4	22.4	22.3
equilibrium temp °C	27.8	27.2	29.2		25.6	25.0	23.9
start temp of metal °C	93.4	93.4	93.4	93.4	93.4	93.4	93.4
mass of metal (g)	46.890	69.910	146.180		69.540	69.780	69.950
<i>experimental</i> specific heat capacity	0.854	0.799	0.388	#DIV/0!	0.421	0.267	0.123
<i>theoretical</i> specific heat capacity	0.897	0.897	0.385	0.385	0.386	0.220	0.138
percent error	-4.8	-10.9	0.7	#DIV/0!	9.0	21.5	-10.7

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Per 2

identity of metal	Al(cube)	Al(cyl)	Cu(cube)	Cu(cyl)	Zn	Sn	Pb
mass of water (g)	139.79	211.23	139	126.09	89.91		82.64
start temp of water °C	22.6	22	22.2	22.1	22.5		22
equilibrium temp °C	27.5	26.9	28.9	25.9	27.6		24.1
start temp of metal °C	98.6	98.6	98.6	98.6	98.6	98.6	98.6
mass of metal (g)	46.89	69.94	146.30	69.82	69.56		69.95
<i>experimental</i> specific heat capacity	0.860	0.864	0.382	0.395	0.389	#DIV/0!	0.139
<i>theoretical</i> specific heat capacity	0.897	0.897	0.385	0.385	0.386	0.220	0.138
percent error	-4.1	-3.7	-0.7	2.7	0.7	#DIV/0!	1.0

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Per 3

identity of metal	Al(cube)	Al(cyl)	Cu(cube)	Cu(cyl)	Zn	Sn	Pb
mass of water (g)	159.30	201.59	139.58	140.86	135.86		
start temp of water °C	22.1	22.1	22.1	22.1	22.0		
equilibrium temp °C	26.5	27.3	28.9	25.8	25.6		
start temp of metal °C	97.8	97.8	97.8	97.8	97.8	97.8	97.8
mass of metal (g)	97.85	70.00	146.12	69.70	69.55		
<i>experimental</i> specific heat capacity	0.421	0.889	0.395	0.435	0.408	#DIV/0!	#DIV/0!
<i>theoretical</i> specific heat capacity	0.897	0.897	0.385	0.385	0.386	0.220	0.138
percent error	-53.1	-0.8	2.5	12.9	5.7	#DIV/0!	#DIV/0!

YUCK!

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Per 4

identity of metal	Al(cube)	Al(cyl)	Cu(cube)	Cu(cyl)	Zn	Sn	Pb
mass of water (g)	126.7	180.94	128.86	70	171.59	133.68	109.7
start temp of water °C	22.4	22.5	22.4		22.0	22.3	22.3
equilibrium temp °C	27.7	27.9	29.4		25.1	24.4	24
start temp of metal °C	97.6	97.6	97.6	97.6	97.6	97.6	97.6
mass of metal (g)	46.88	70.00	146.29		69.49	69.83	69.89
<i>experimental</i> specific heat capacity	0.858	0.838	0.379	#DIV/0!	0.442	0.230	0.152
<i>theoretical</i> specific heat capacity	0.897	0.897	0.385	0.385	0.386	0.220	0.138
percent error	-4.3	-6.5	-1.7	#DIV/0!	14.5	4.5	10.0