Micro-bomb Calorimetry
List of Materials

Approximate prices as of January 2007.
Materials may be modified (e.g., tubing diameter).

	Part # or ID	Description	$US
1		Benzoic acid standard (15g)	15
2	1570a	NIST Spinach (60g)	500
3		Ni-Cr fuse wire (≈4500 cm length)	20
4	EMQSS-062E-6	Omega Thermocouple	25
5	EXPP-E-245-25	Omega T/C Extension Wire (25-ft)	25
6		Ignitor (e.g., Radio Shack)	25
7	CR10 or CR10X	Datalogger (Campbell Scientific)	1000
Swagelok # (SS=stainless steel)			
8	SS-QC-B-4PF	SS quick connect	32
9	SS-QC4-D-4PM	SS quick connect with valve	23
10	SS-7R4PM4PM4-4O	TP hose	45
11	SS-4-CS	SS cross (1/4")	35
12	B-4P4T2-SC11	Brass quarter turn instrument plug valve*without* downstream vent.	35
13	B-4P4V2-SC11	Brass quarter turn instrument plug valve *with*downstream vent.	45
14	SS-100-1-4BT	SS Swagelok tube fitting	16
15	SS-4-HCG	SS hex coupling	8
16	SS-4-HRN-2	SS hex reducing nipple	5
17	MS-TFS-50	PTFE-free pipe thread sealer	16
18	MS-SNOOP-8oz	Snoop® liquid leak detector	4
19		Oxygen hose	50
20		Oxygen regulator that matches hose connection	Not cheap

Footnotes:

2 Barter for 2g from a lab and you will have several hundred pellets.

3 The platinum fuse wire does not give off heat but is much more expensive.

4 Purchase at least two thermocouples as it may (will) break after many cleanings. Temperature range is from -200 to 900 °C. Sheath diameter = 0.062 inches (thinnest available at this time).

6 Can cost several hundred dollars from a scientific supplier but this one worked just fine.

7 Sample program and instructions listed below (along with associated files).

12 Use “SC” (special cleaning) valves with oxygen. The SC valves cost $35-50 compared to $25 for the non-SC. Best to use a valve *without* downstream venting on both sides of micro-bomb. Isolating the bomb is important.

13 A valve *with* a downstream vent is not required but if you do purchase this one then it must be installed *downstream* of the calorimeter.

14 Ferrule is permanently set when tightened. Install only after all other connections are tightened, the system is leak-proof and you know exactly where the thermocouple rests within the micro-bomb. Again, keep a spare thermocouple and Swagelok tube fitting.

19 The oxygen hose and regulator must match in diameter and fitting type