Loss on Ignition (LOI) – Determining the Total Volatile Content

1. Turn muffle furnace on and set control dial at obvious mark. Do so approximately two hours before you want to start procedure in order to bring temperature of furnace up to desired temperature of 950°C.

2. Turn on electronic balance and calibrate it at beginning of the workday.

3. Remove wire basket from large desiccator near furnace. Using a forceps to move crucible, not your fingers, weigh the clean and dry porcelain crucible directly. Note and record its name from the outside bottom of the crucible. Also record sample powder name which is being weighed into crucible. No weighing paper is required. As usual, record all weighing to four decimal places.

4. Add approximately 1 gram of finely ground rock powder.

5. Record weight of crucible plus sample. Make sure bottom of crucible has some identifying mark; if not, make one by scratching bottom of crucible.

6. Do steps 3 through 5 for each of your sample powders. A maximum of 8 samples can be done at one time.

7. Place in muffle furnace for 60 minutes at 950°C.

8. Remove basket from furnace and place in desiccator as quickly as possible. Let cool to room temperature and weigh. (Keep in mind the demonstration of this procedure).
9. Weight of sample before heating minus the weight after heating is "initial" loss on ignition. (NOTE: if sample has lost weight, the loss is positive; if it has gained weight, the loss is negative).

10. Determine % loss on ignition by dividing "initial loss" by initial weight of sample and multiply by 100.

11. To obtain the true loss on ignition for the sample:

(a) Multiply 0.111348 times the weight % FeO (determined by titration).

(b) Add this value to the loss on ignition (whether + or -). This sum is the true loss on ignition.

12. Empty each crucible, clean them, and finally rinse them with acetone and set on a paper towel to air dry. Load them back into the wire basket using forceps and put basket back into furnace for several minutes. Remove and place basket in the large desiccator. Now they are ready for immediate use by the next person.

Last Revised: August 2015