

Quantitative analysis of two Lead Oxide active plate materials.

Two plate active materials were presented for X-ray diffraction analysis, labelled as follows:

- Sample #1, [REDACTED]
- Sample #2, [REDACTED]

Red and yellow lead oxides (PbO, Litharge and Massicot, respectively) forms, and the so-called “tribasic lead sulphate” $3\text{PbO.PbSO}_4.\text{H}_2\text{O}$, were found in varying quantities in these samples, as outlined in Table 1 below. “Tetrabasic lead sulphate” 4PbO.PbSO_4 was not found in either sample. The analytical data are presented in Appendix A.

Table 1: Quantitative analysis results for lead oxide – lead sulphate mixtures.

Sample	Sample #1 (suspect)	Sample #2 (standard)
PbO red	53.3	56.5
PbO yellow	0.5	0.3
$3\text{PbO.PbSO}_4.\text{H}_2\text{O}$	46.2	43.2
4PbO.PbSO_4	0.0	0.0

In the present instance, it was found that crystallographic factors did not vary significantly between samples. The maximum strain observed in any phase was 0.05%.

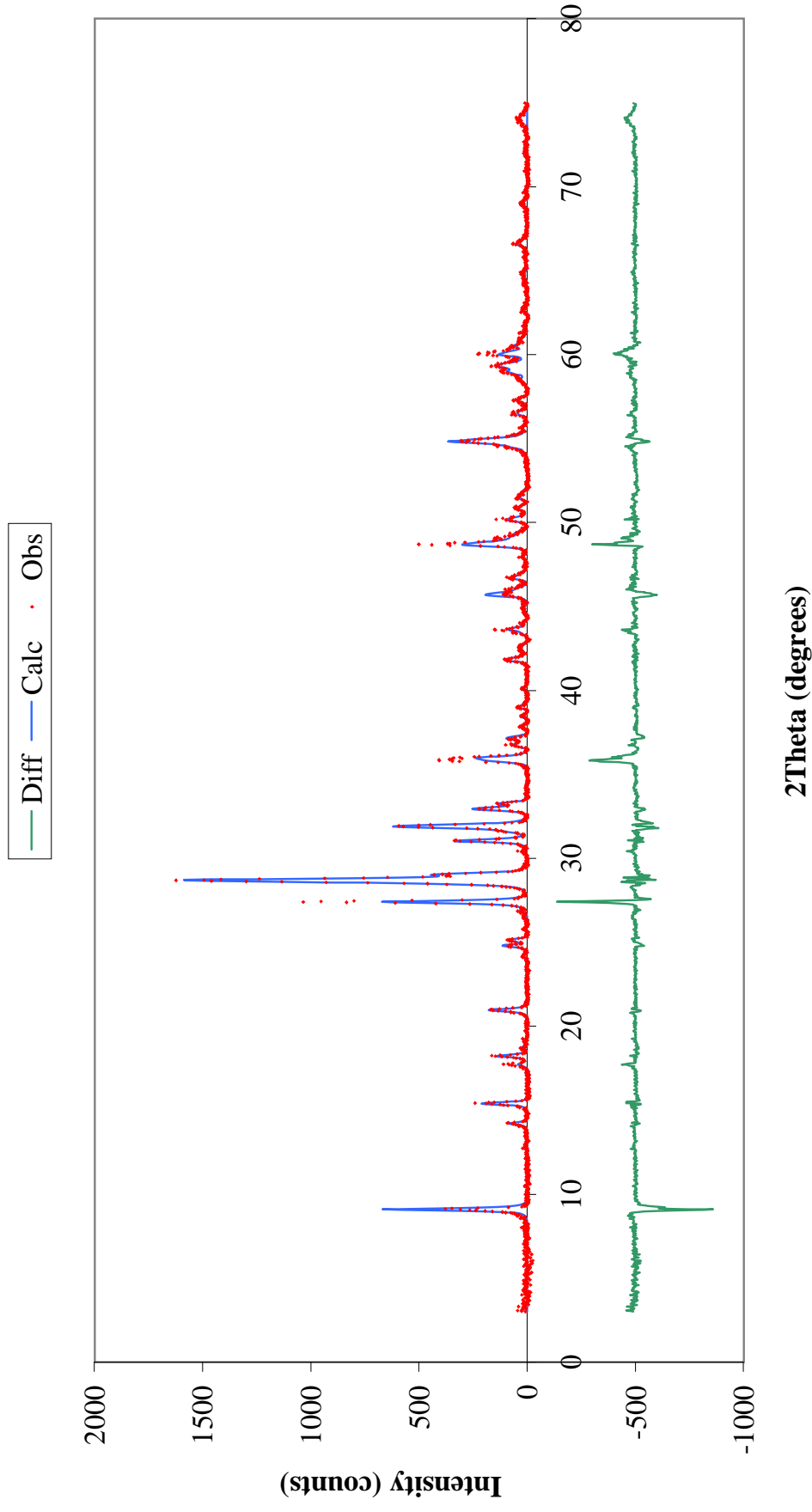
In any event, Sample #2 has a slightly redder colouration than Sample #1, but this variation is attributed to the minor difference in yellow PbO contents.

To reiterate, no unwanted phase such as Tetrabasic Lead Sulphate was found in either sample.

Appendix A

Rietveld Plots of Lead Oxide - Lead Sulphate Mixtures.

Sample #1



Sample #2

