SGS TEC SERVICES
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December 28, 2022

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Subject: **Report of Semi Quantitative X-Ray Diffraction Analysis**
West Virginia Geological Survey (WVGS)
Crushed Dolomite Rock Samples
SGS TEC Services Project No. 22287, Lab ID 22-1984

Ms. Royce:

SGS TEC Services, Inc., an AASHTO R18, ANS/ISO/IEC Standard 17025:2017 and an Army Corps of Engineers accredited laboratory, is pleased to submit this report of the mineral concentrations determined by semi-quantitative x-ray diffraction (XRD) analysis on crushed dolomite rock samples provided by WVGS, identified as numbers 01-25. The results pertain only to the samples tested. Our services were performed in accordance with the terms and conditions of our current agreement.

Representative samples were obtained from the provided crushed dolomite rock for testing. The test specimens were prepared for XRD testing by WVGS personnel. The test specimens were scanned over a range of 5° to 80° 2Θ using Cu Kα radiation at 40kV/15mA. Mineral phases were identified with computer-assisted programs of a powder diffraction database. The estimated mineral concentrations reported in Table 1 (attached at the end of this report) are based on relative peak intensities and Whole Powder Pattern Fitting (WPPF)/Rietveld analysis performed by Rigaku's SmartLab II Software. The diffractograms of the scans are attached at the end of our report in Figures 1-25.

We appreciate the opportunity of providing our services to you. If you have any questions pertaining to this report or need any additional information, please do not hesitate to call us.

Sincerely,

SGS TEC SERVICES, INC.

Terry L. Vines, P.G.
Principal Petrographer/Geologist
GA Registration No.: 0570

Holden Tracy
Staff Geologist

Attachments: Table 1. Semi Quantitative Results of XRD Analyses
Figures 1-25: Diffractograms of XRD Analyses

Table 1. XRD Results of WVGS Crushed Dolomite Rock Samples

Sample #	Dolomite ($MgCa(CO3)_2$)	Calcite ($CaCO_3$)	Quartz (SiO_2)	Illite (Varies)	Kaolinite ($Al_2(OH)_4Si_2O_5$)	Microcline ($KAlSi_3O_8$)
01	78.2	14.6	7.2	-		-
02	63.5	24.5	5.4	3.9	2.7	-
03	64.0	26.0	4.7	-	5.3	-
04	77.1	12.9	6.4	-	3.6	-
05	74.5	18.7	6.8	-	-	-
06	84.2	9.1	6.7	-	-	-
07	74.3	12.4	13.3	-	-	-
08	80.3	8.4	11.3	-	-	-
09	95.7	1.8	2.5	-	-	-
10	96.7	1.2	2.1	-	-	-
11	91.6	2.6	5.8	-	-	-
12	87.0	3.0	10.0	-	-	-
13	86.0	4.0	10.0	-	-	-
14	94.9	0.3	4.8	-	-	-
15	94.6	0.3	5.1	-	-	-
16	94.3	0.5	5.2	-	-	-
17	80.5	1.4	18.1	-	-	-
18	85.5	-	9.4	-	-	5.1
19	85.9	0.3	13.8	-	-	-
20	88.6	-	6.5	4.9	-	-
21	90.1	-	9.91	-	-	-
22	82.4	-	13.3	-	-	4.3
23	86.3	0.8	12.9	-	-	-
24	50.5	27.0	10.7	5.4	6.4	-
25	58.7	20.5	9.7	6.4	4.7	-

Figure 1. Sample 01 Diffractogram

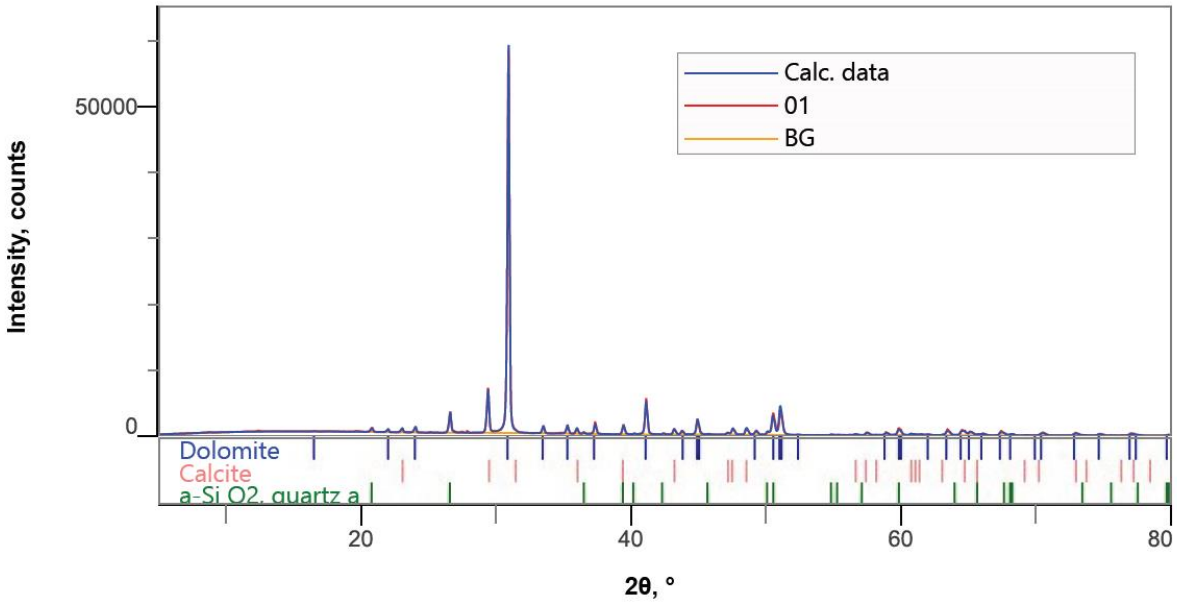


Figure 2. Sample 02 Diffractogram

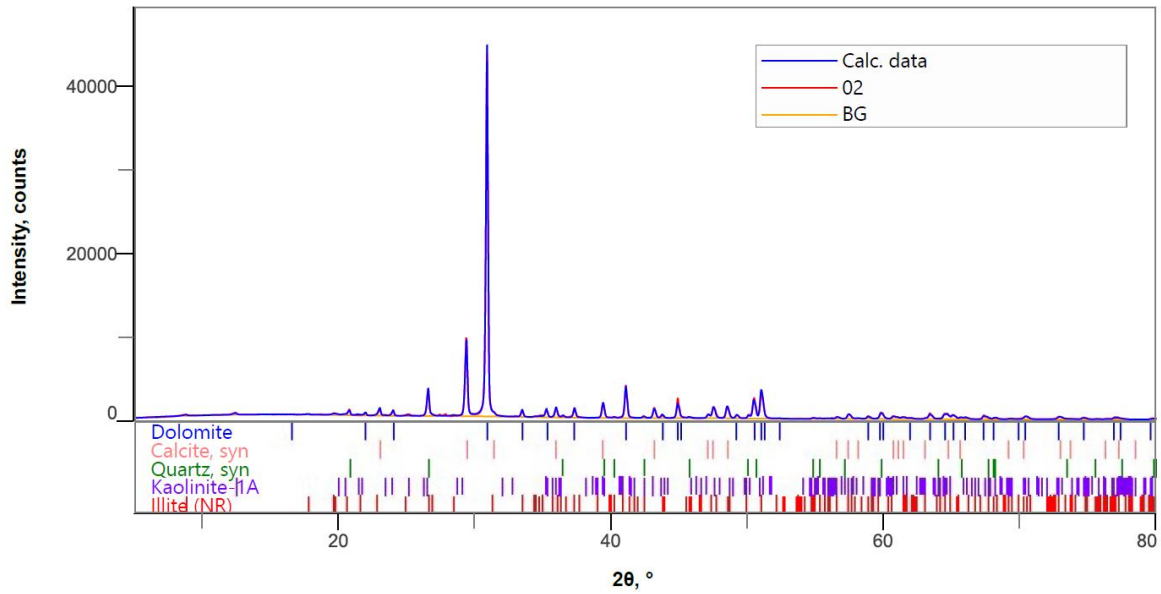


Figure 3. Sample 03 Diffractogram

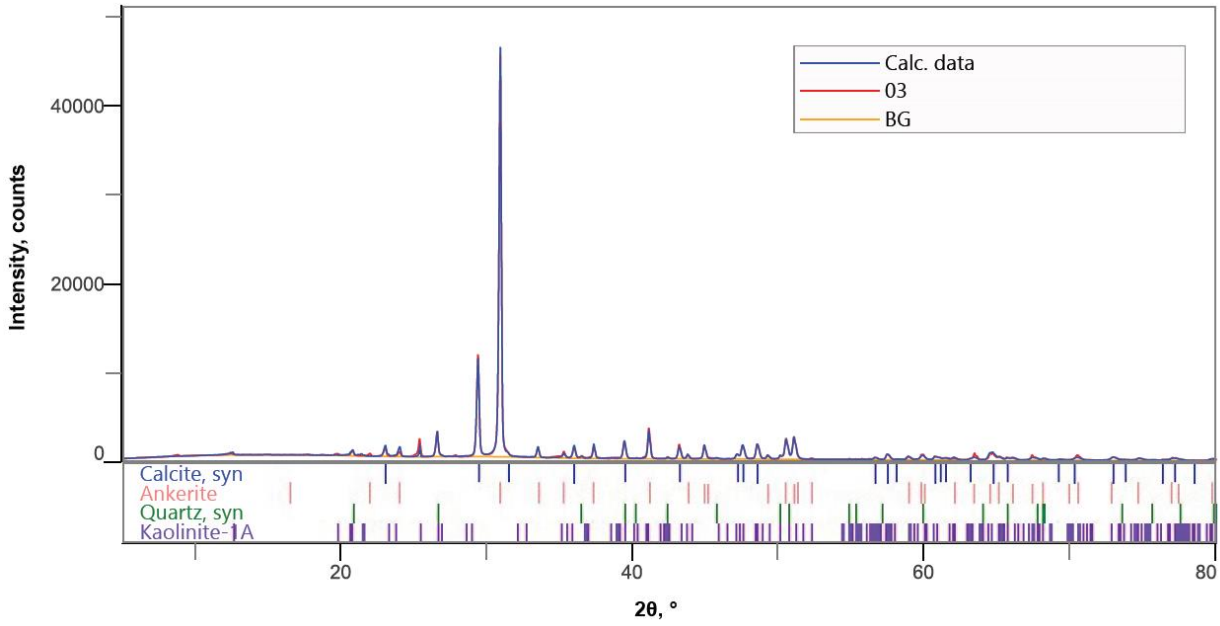


Figure 4. Sample 04 Diffractogram

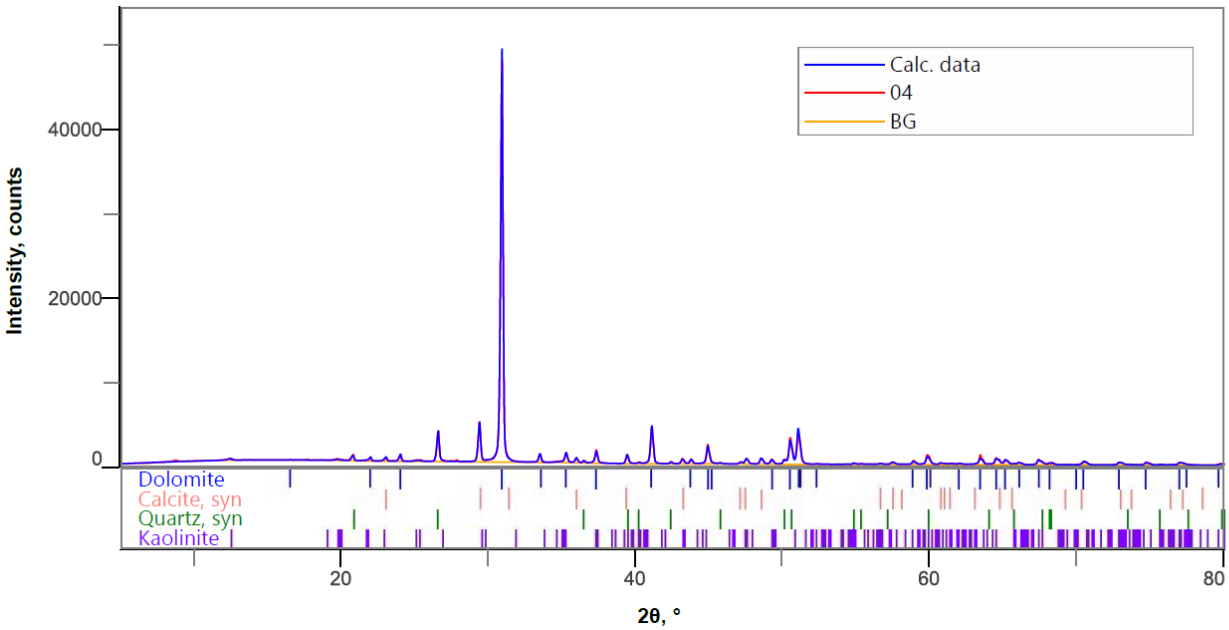


Figure 5. Sample 05 Diffractogram

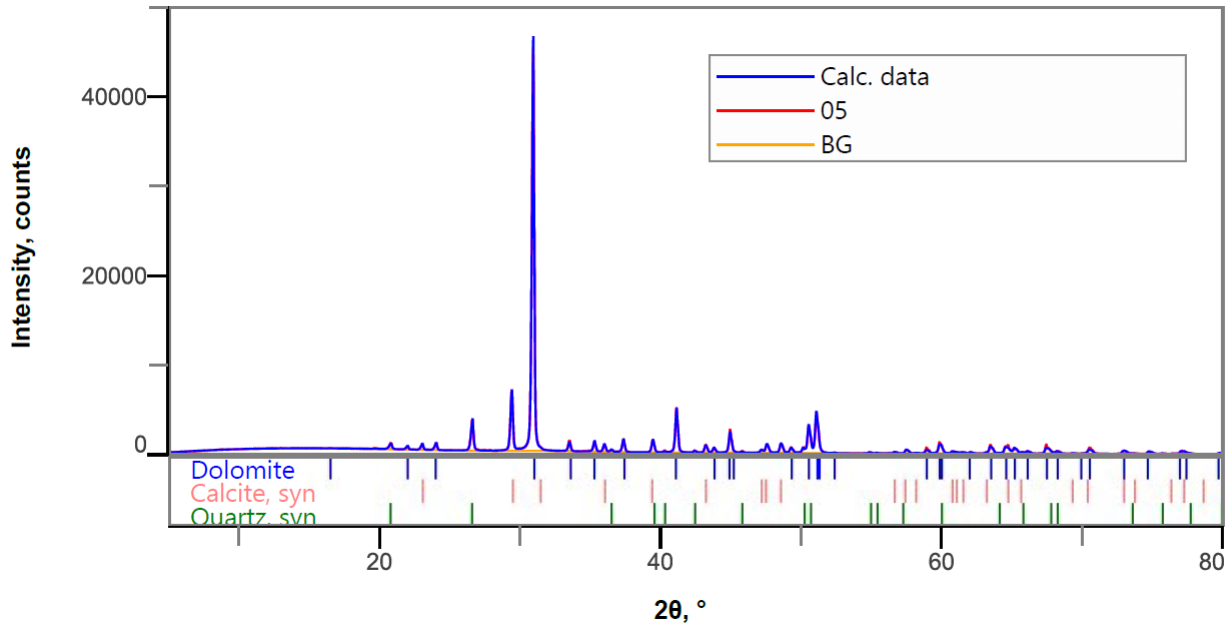


Figure 6. Sample 06 Diffractogram

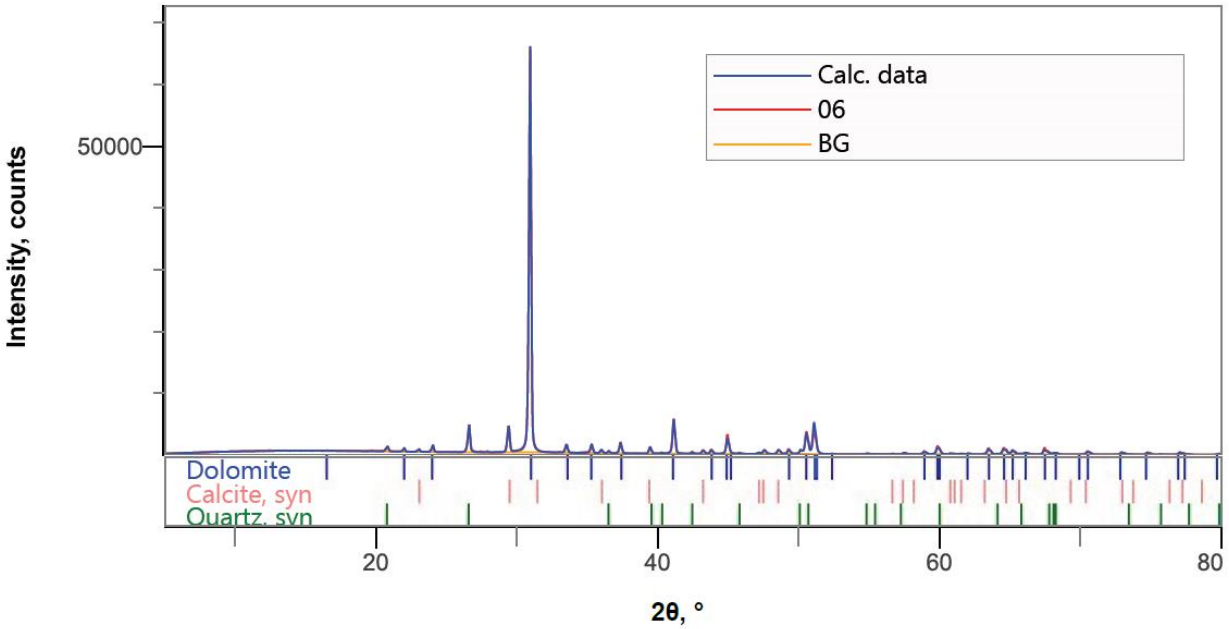


Figure 7. Sample 07 Diffractogram

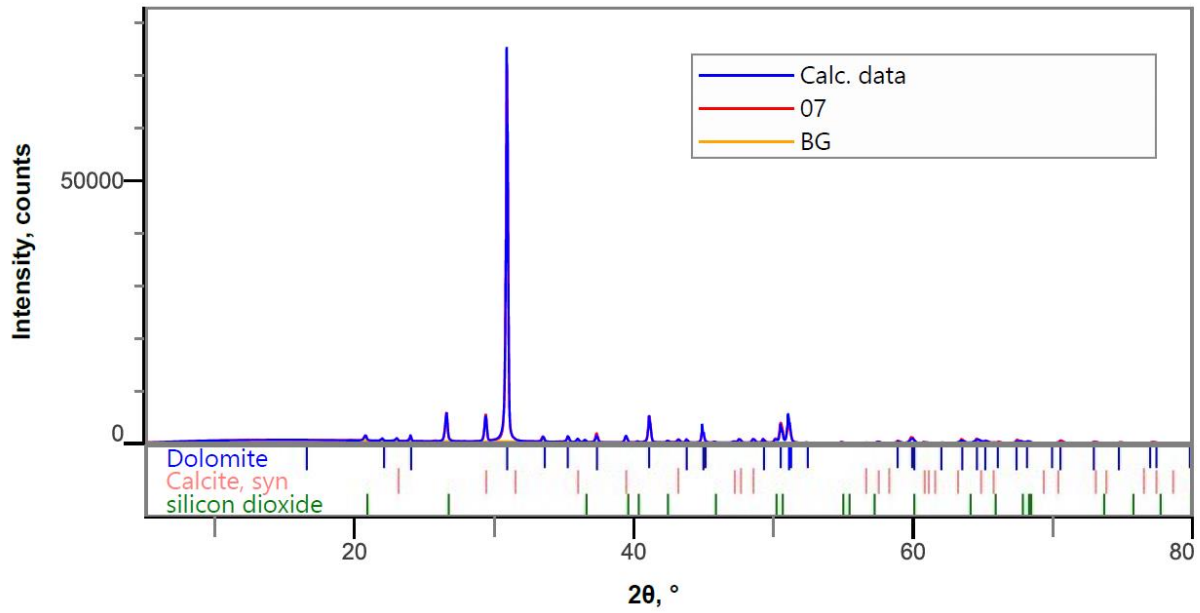


Figure 8. Sample 08 Diffractogram

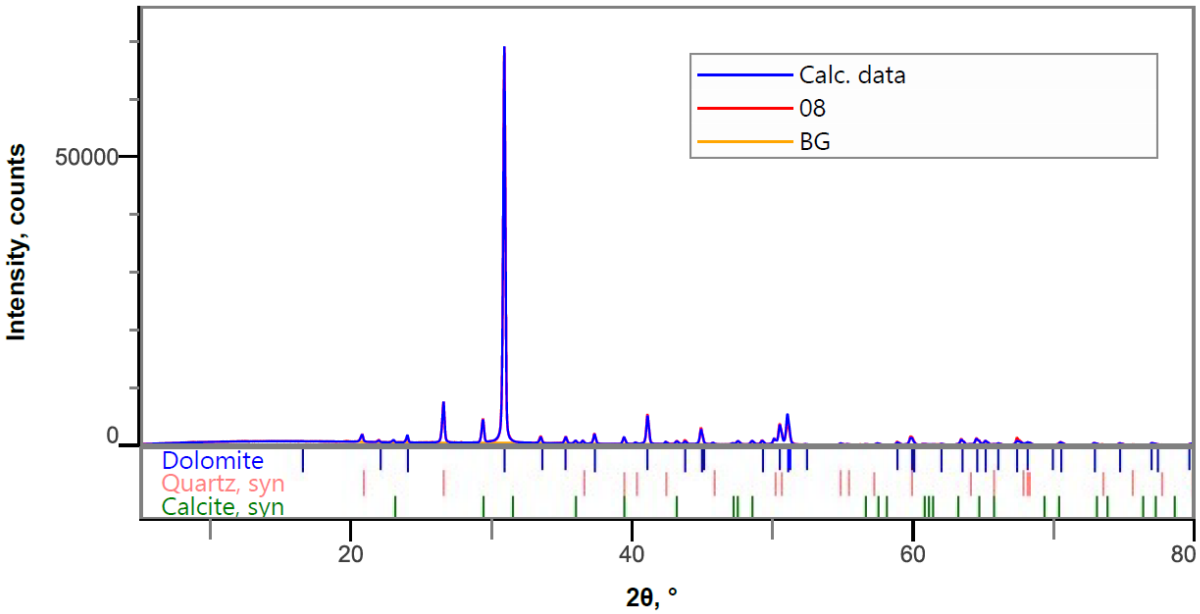


Figure 9. Sample 09 Diffractogram

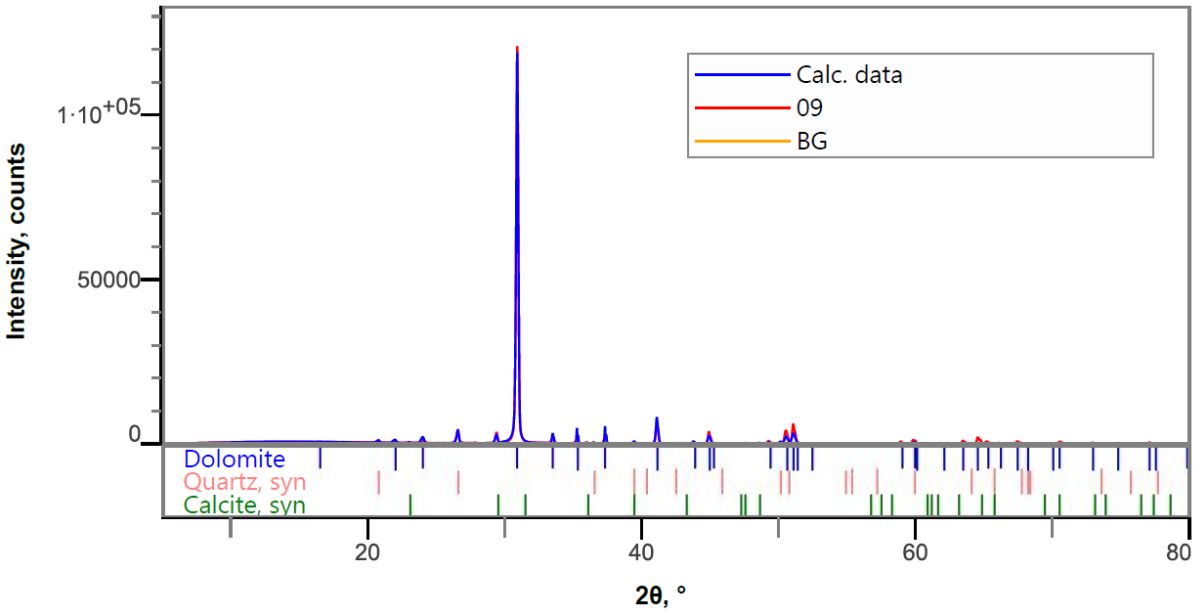


Figure 10. Sample 10 Diffractogram

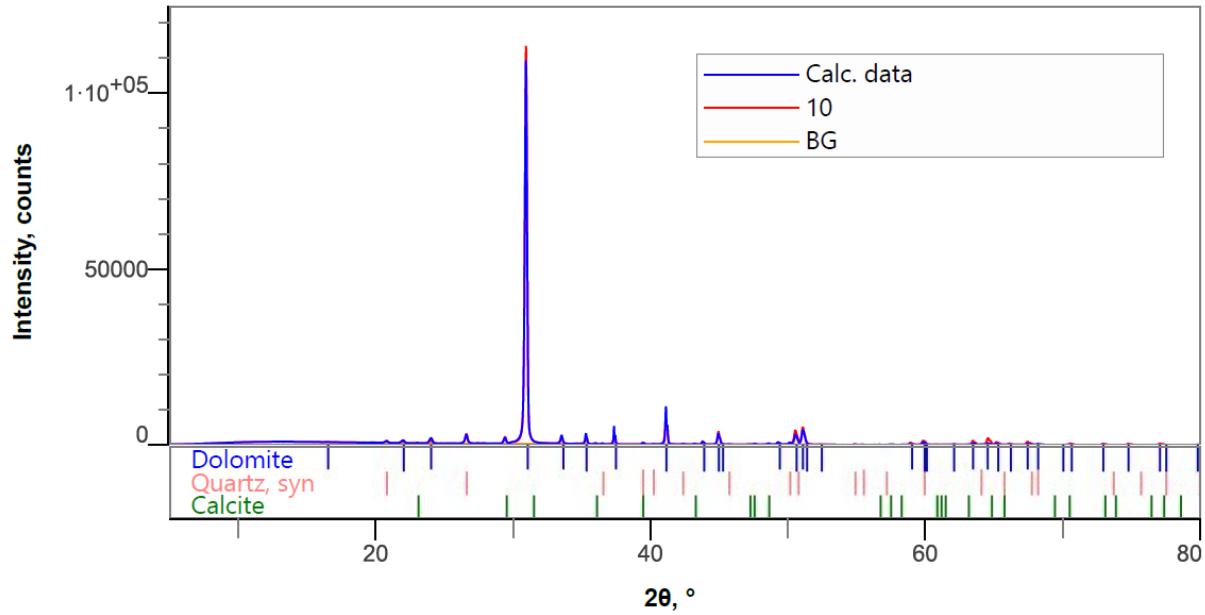


Figure 11. Sample 11 Diffractogram

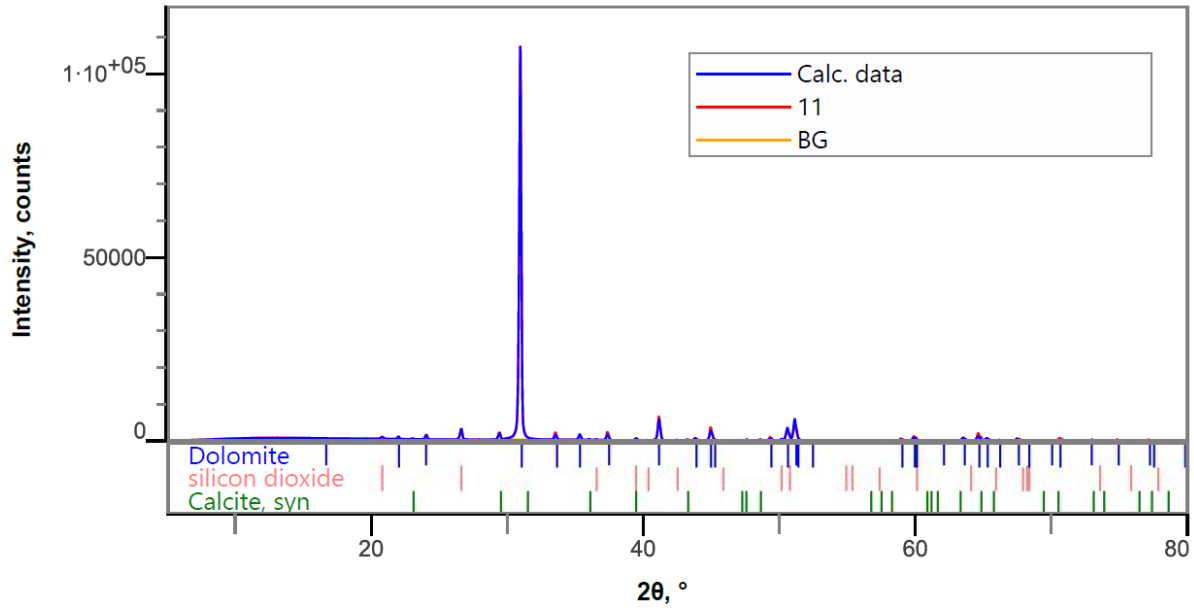


Figure 12. Sample 12 Diffractogram

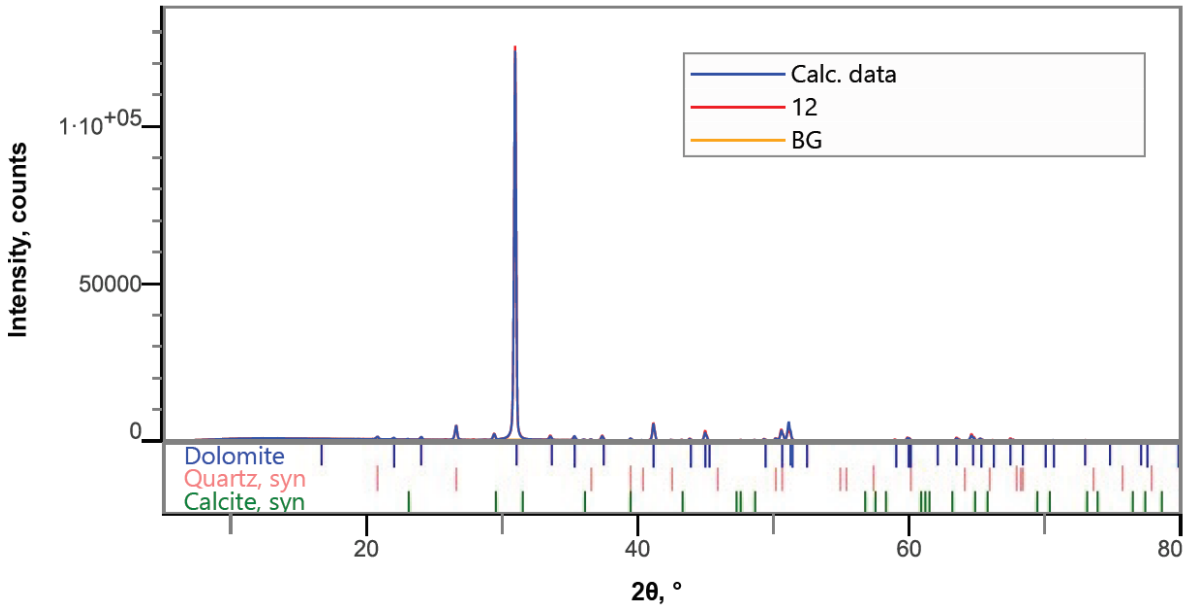


Figure 13. Sample 13 Diffractogram

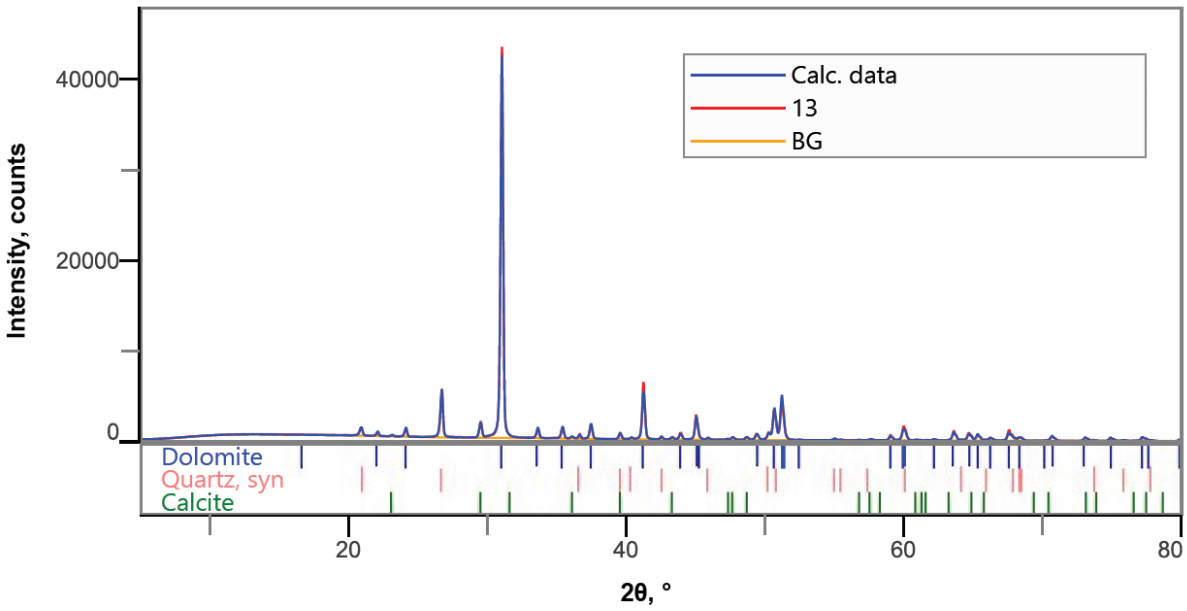


Figure 14. Sample 14 Diffractogram

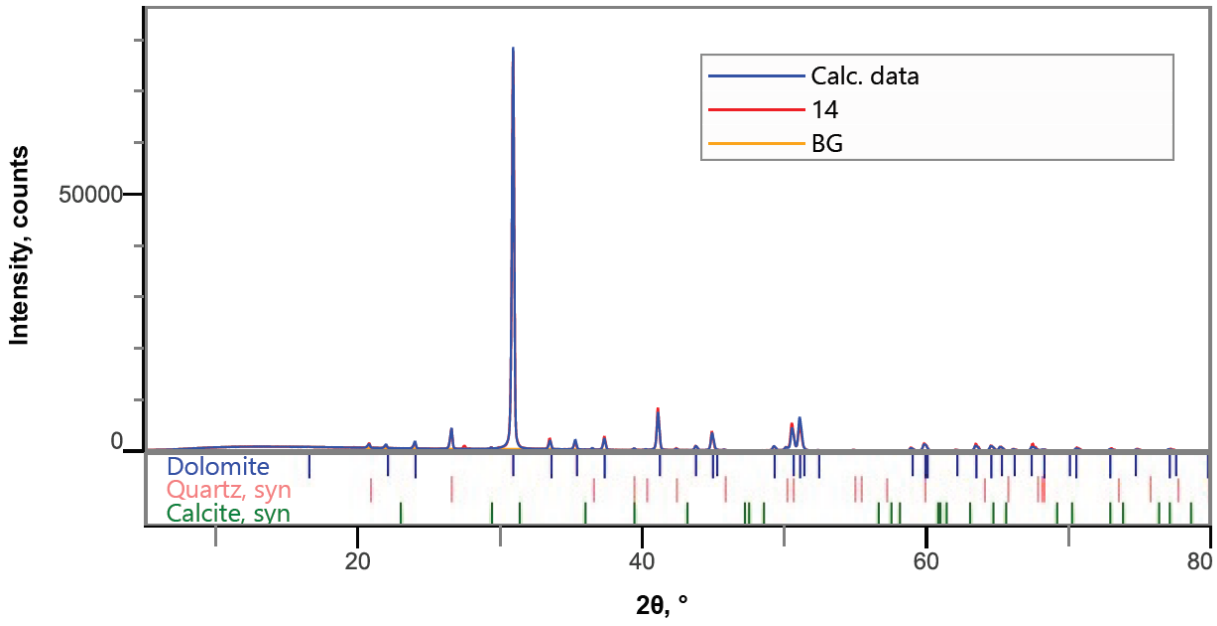


Figure 15. Sample 15 Diffractogram

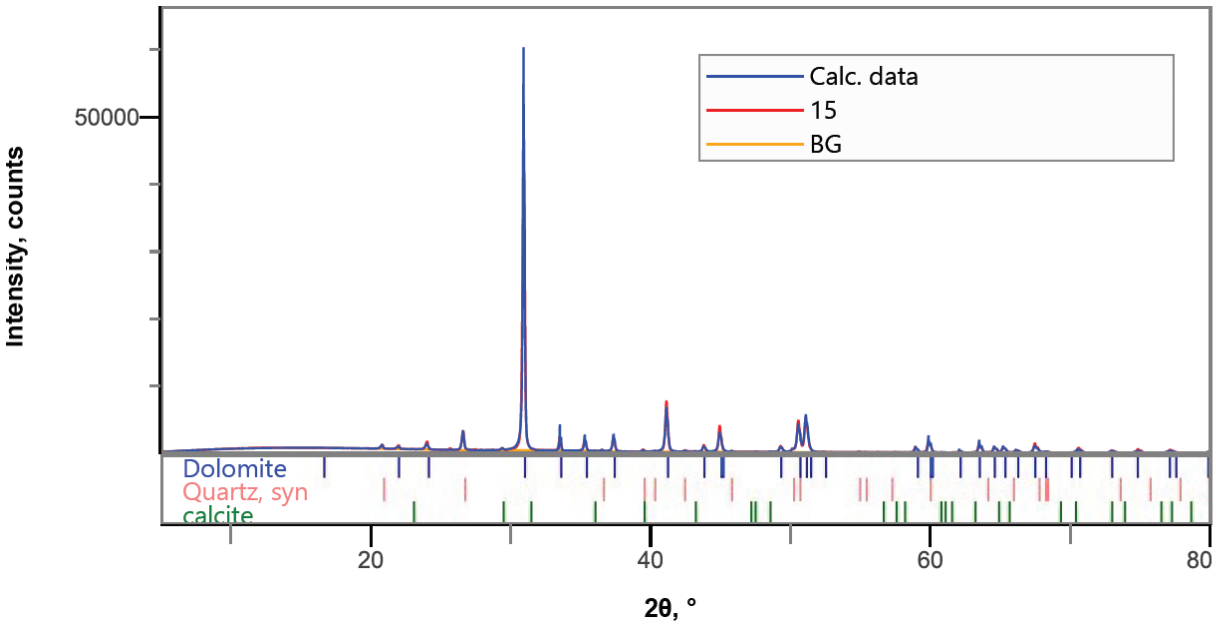


Figure 16. Sample 16 Diffractogram

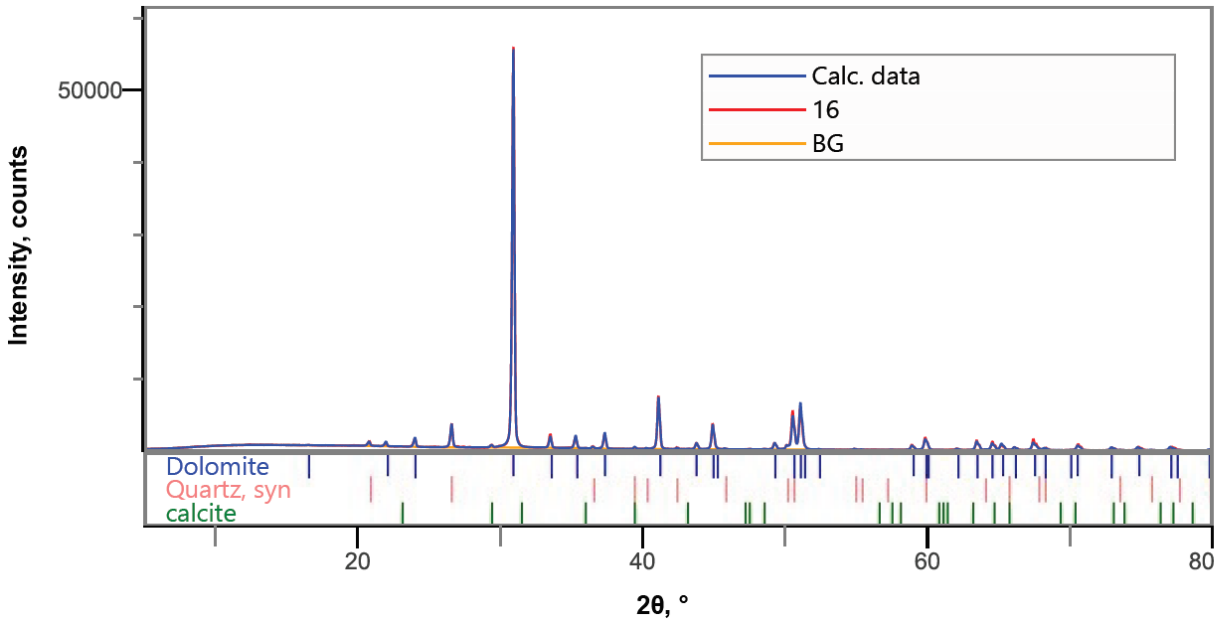


Figure 17. Sample 17 Diffractogram

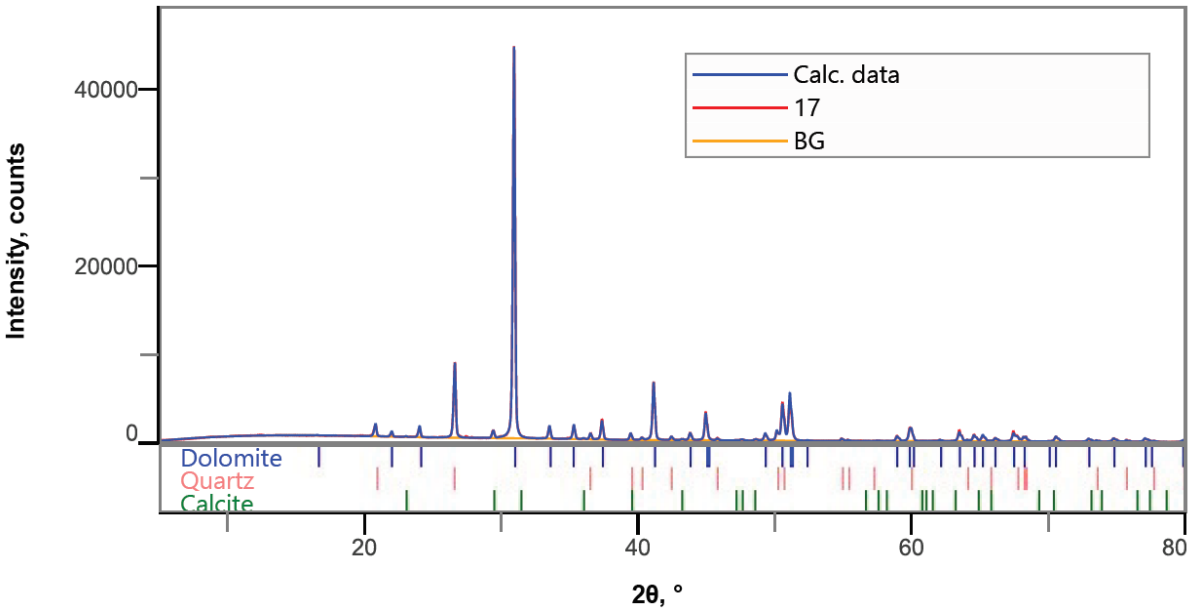


Figure 18. Sample 18 Diffractogram

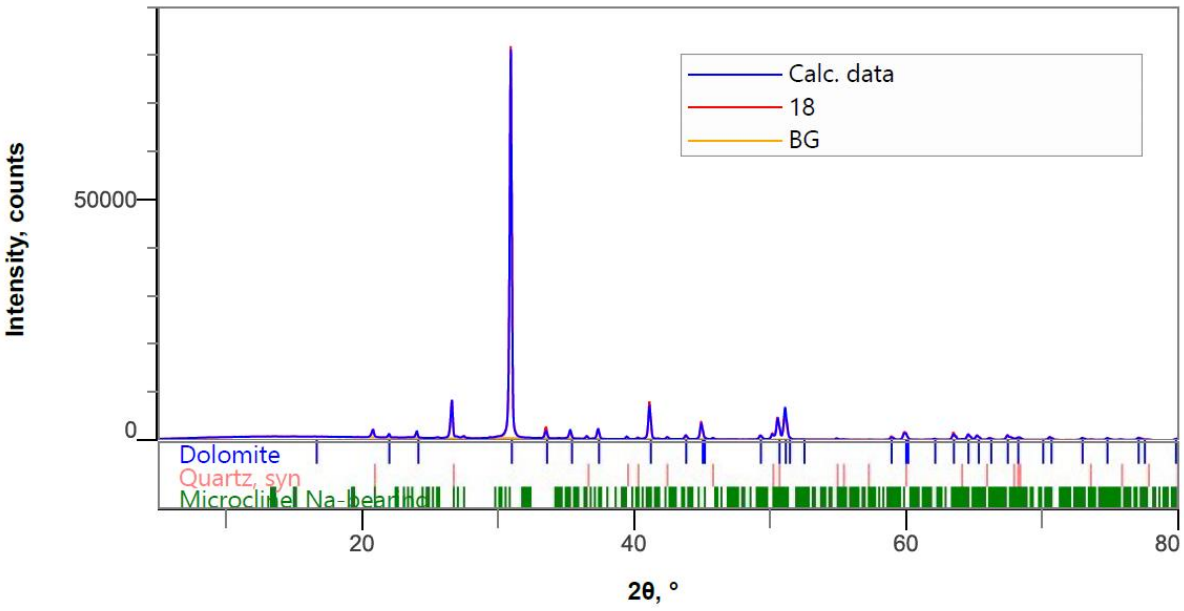


Figure 19. Sample 19 Diffractogram

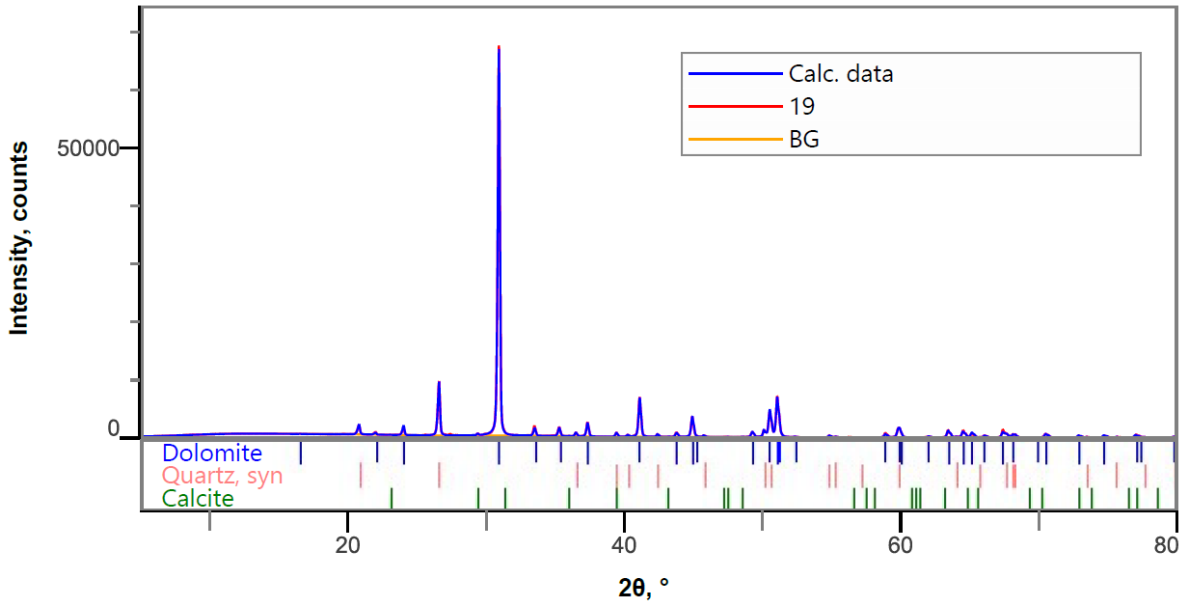


Figure 20. Sample 20 Diffractogram

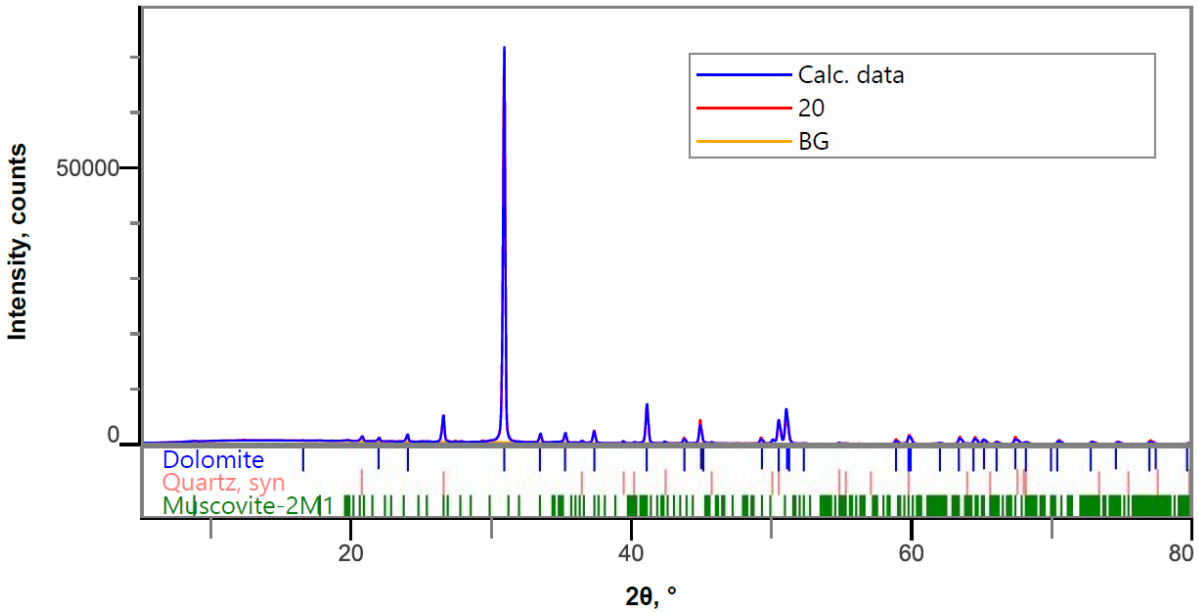


Figure 21. Sample 21 Diffractogram

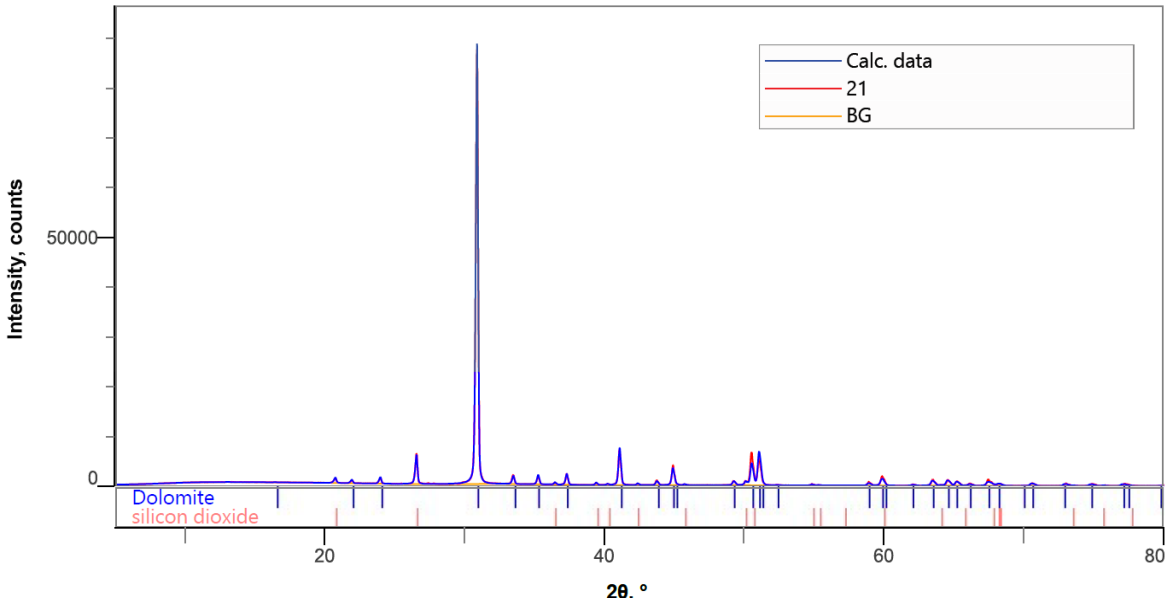
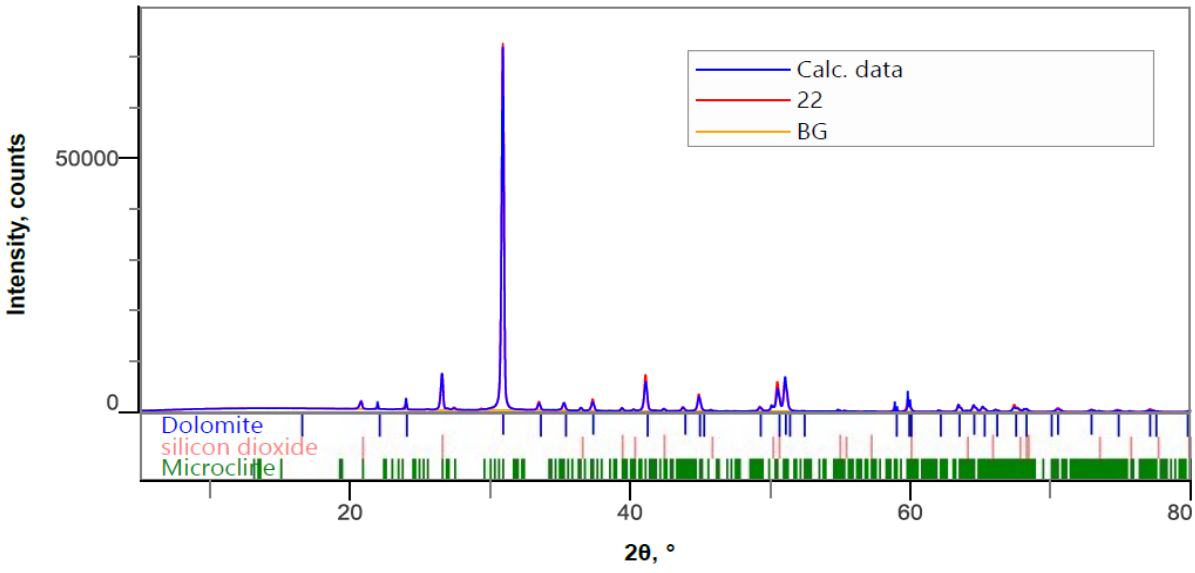


Figure 22. Sample 22 Diffractogram



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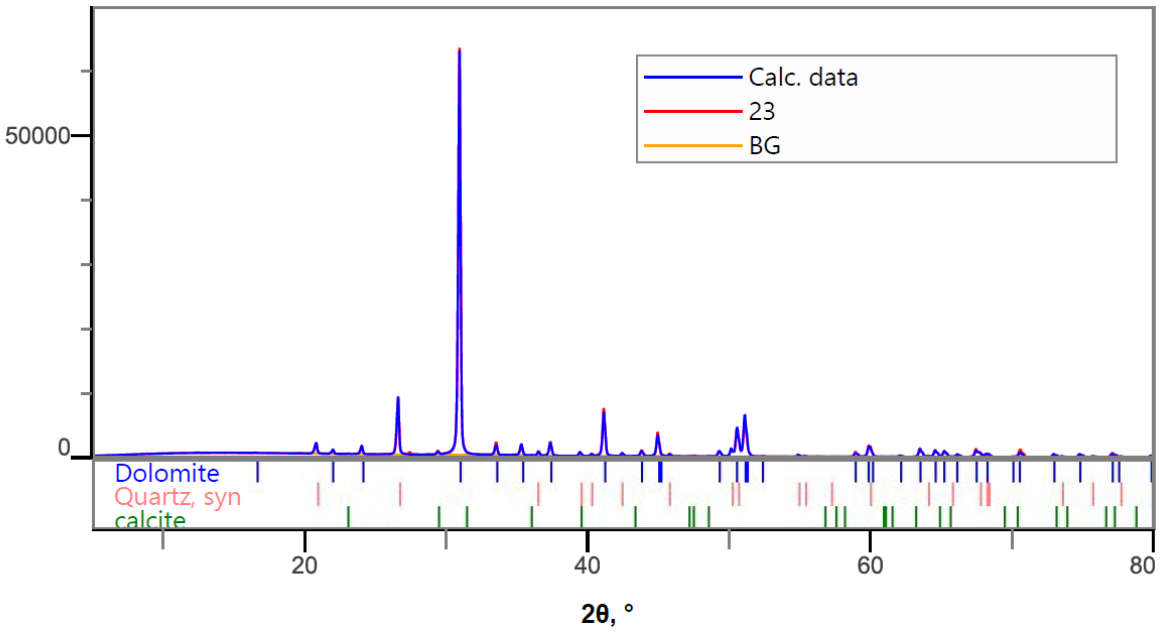

Figure 24. Sample 24 Diffractogram

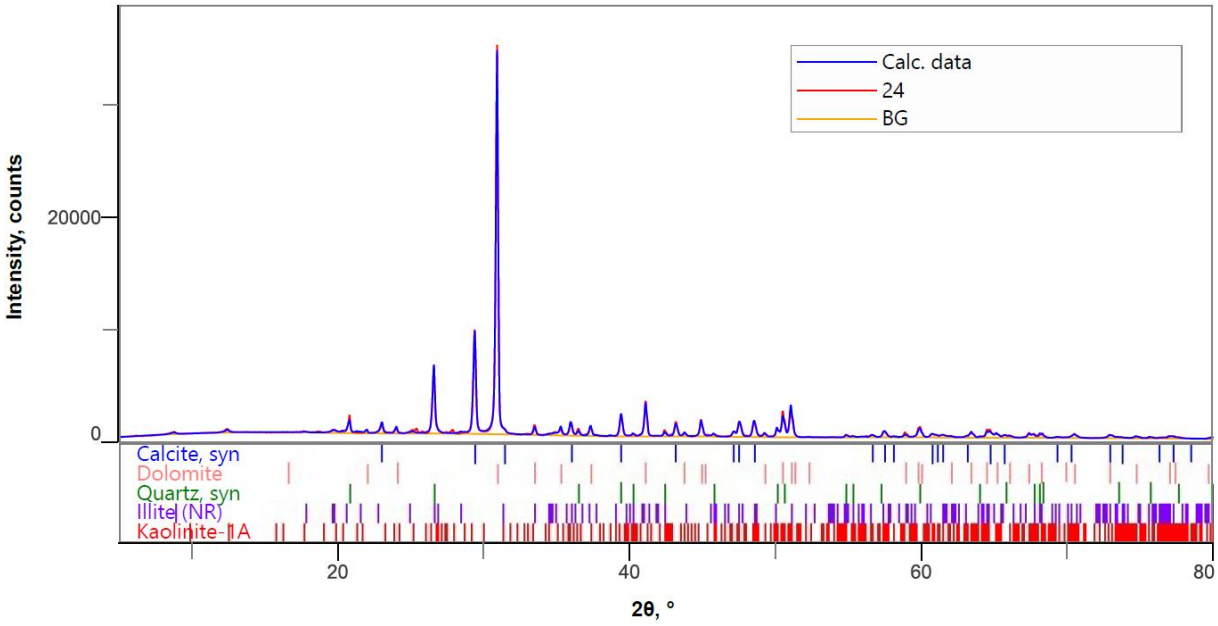

Figure 25. Sample 25 Diffractogram