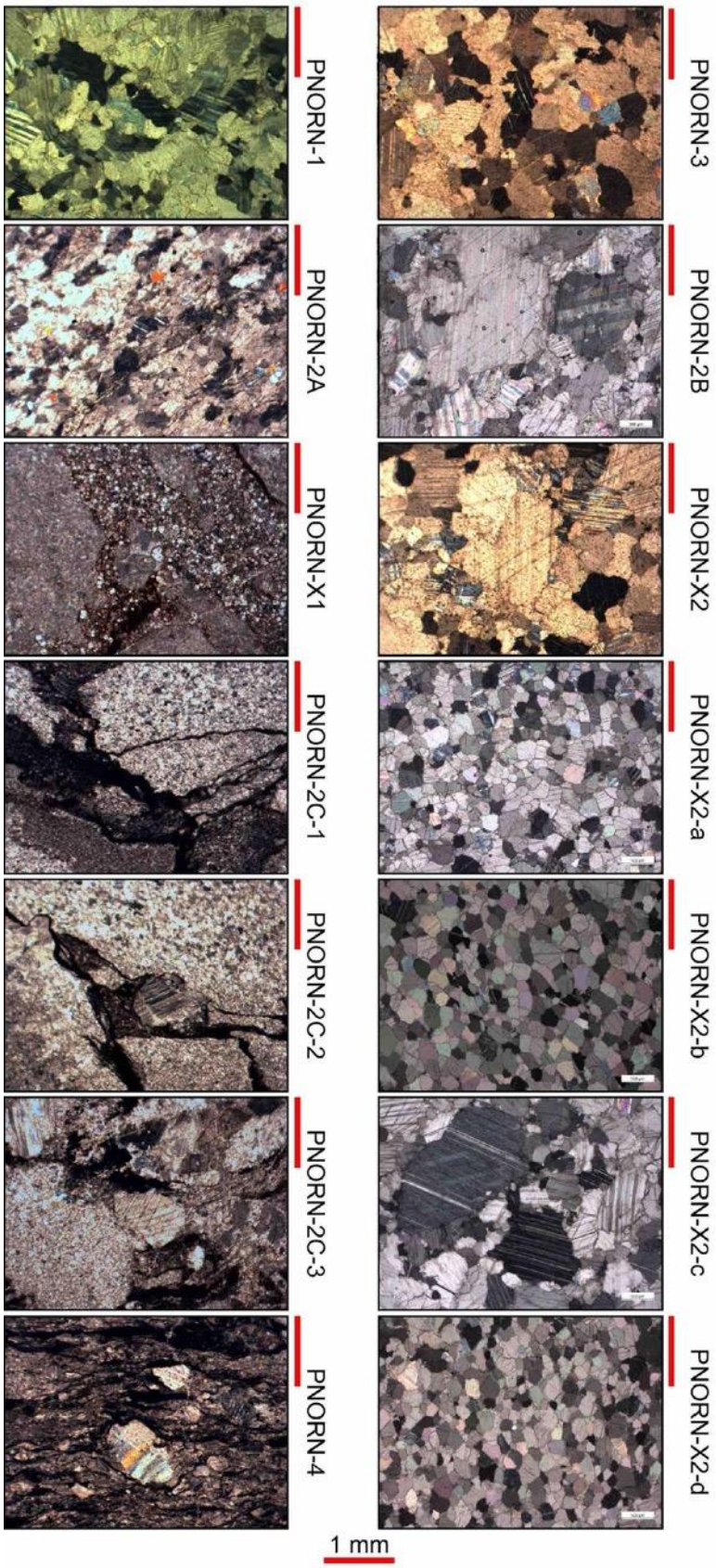

Fig. S1 TOM microphotographs (XP: cross-polars, 25X) of polychrome samples (left column), *Greco scritto* (top-right column), and white marbles (right column except top-right image). Red bars are 1 mm

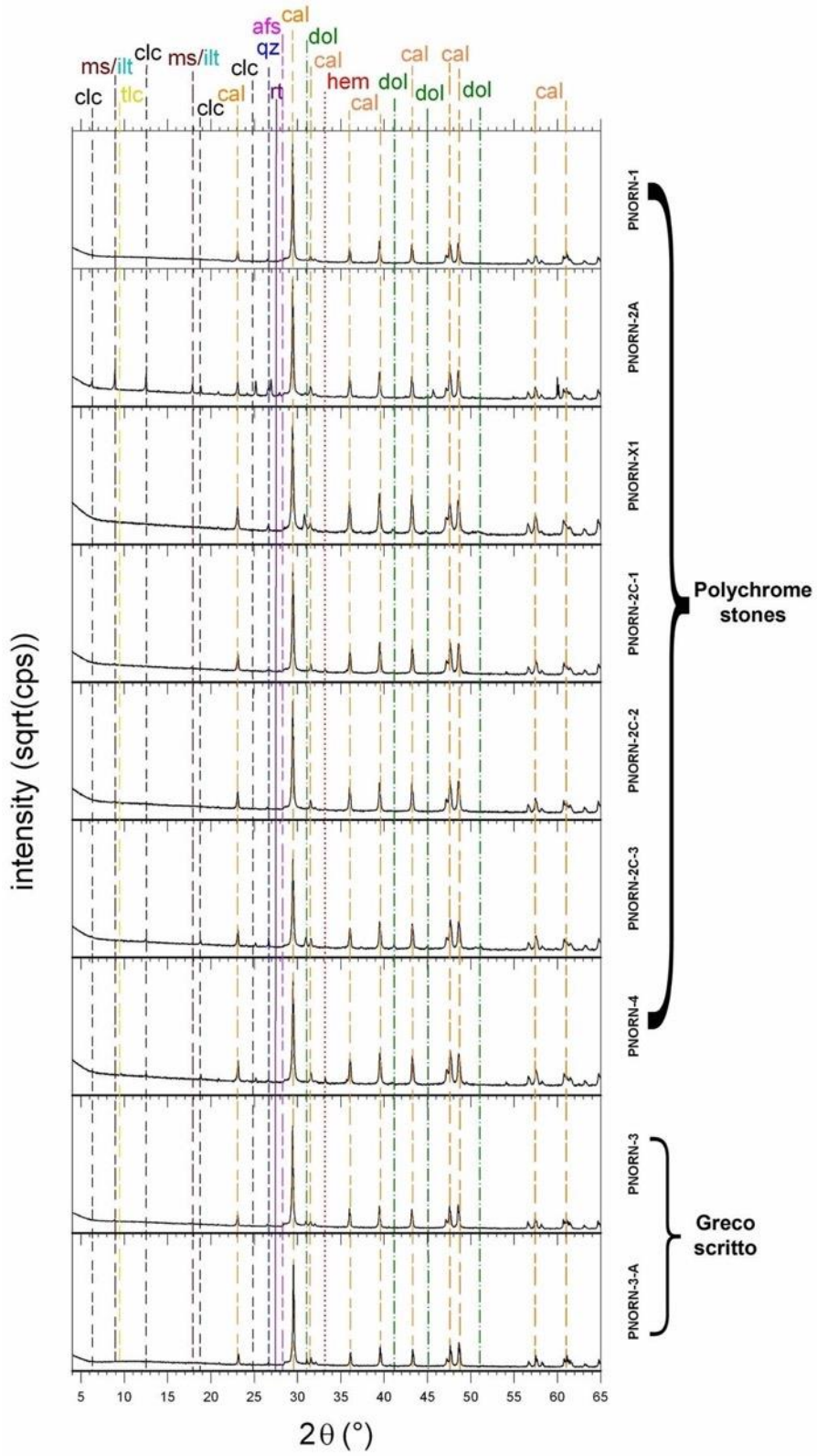

Fig. S2a Stacked XRPD patterns of polychrome and some *Greco scritto* stones. Intensities are expressed in square root to emphasise reflections with lower intensities. Vertical coloured lines indicate the position of the most intense Bragg reflections: cal = calcite, dol = dolomite, qz = quartz, afs = alkali feldspar, ms = muscovite; ilt = illite, clc = clinochlore, tlc = talc, hem = hematite, rt = rutile

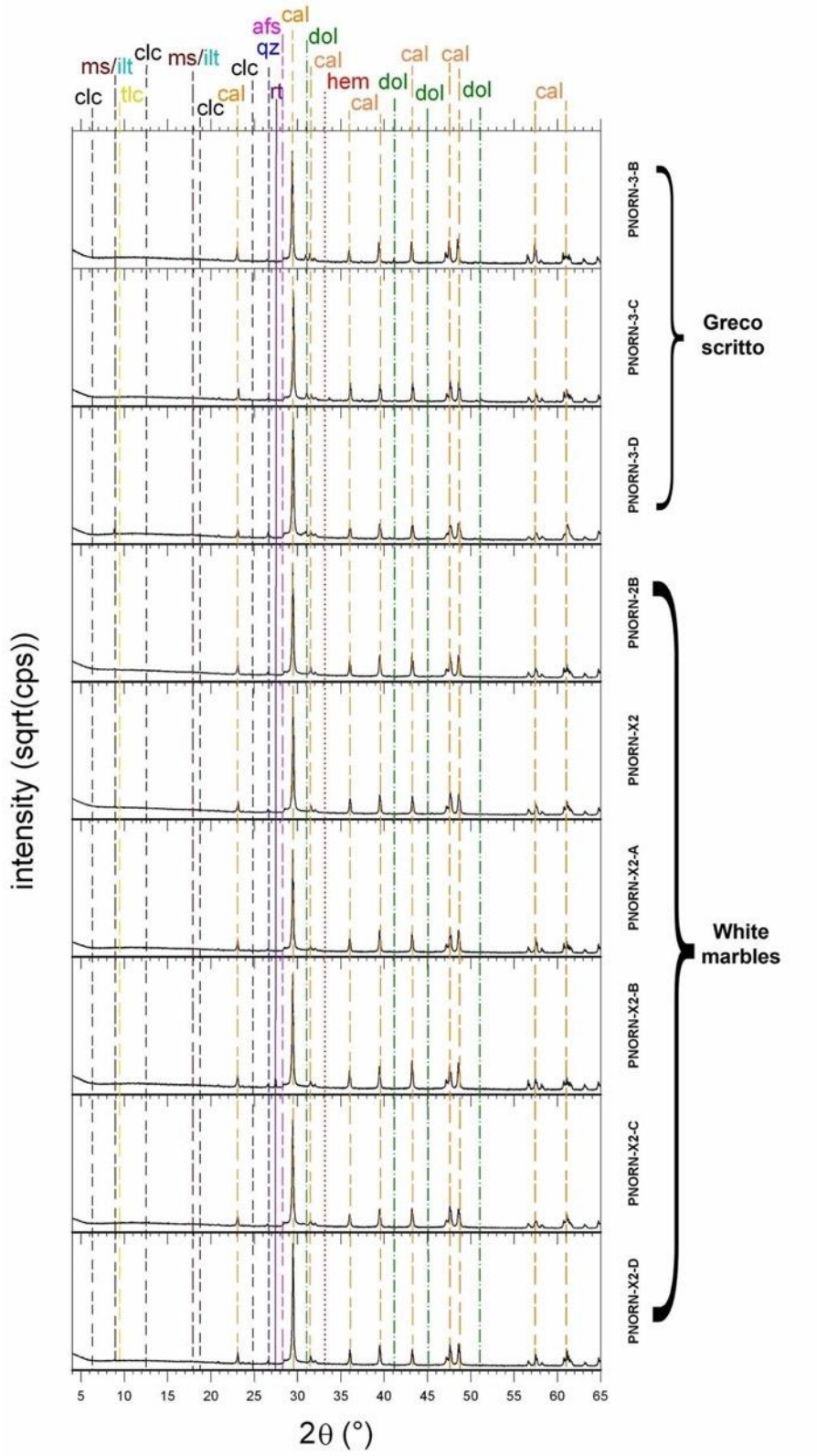

Fig. S2b Stacked XRPD patterns of some *Greco scritto* and white marble stones. Intensities are expressed in square root to emphasise reflections with lower intensities. Vertical coloured lines indicate the position of the most intense Bragg reflections: cal = calcite, dol = dolomite, qz = quartz, afs = alkali feldspar, ms = muscovite; ilt = illite, clc = clinochlore, tlc = talc, hem = hematite, rt = rutile

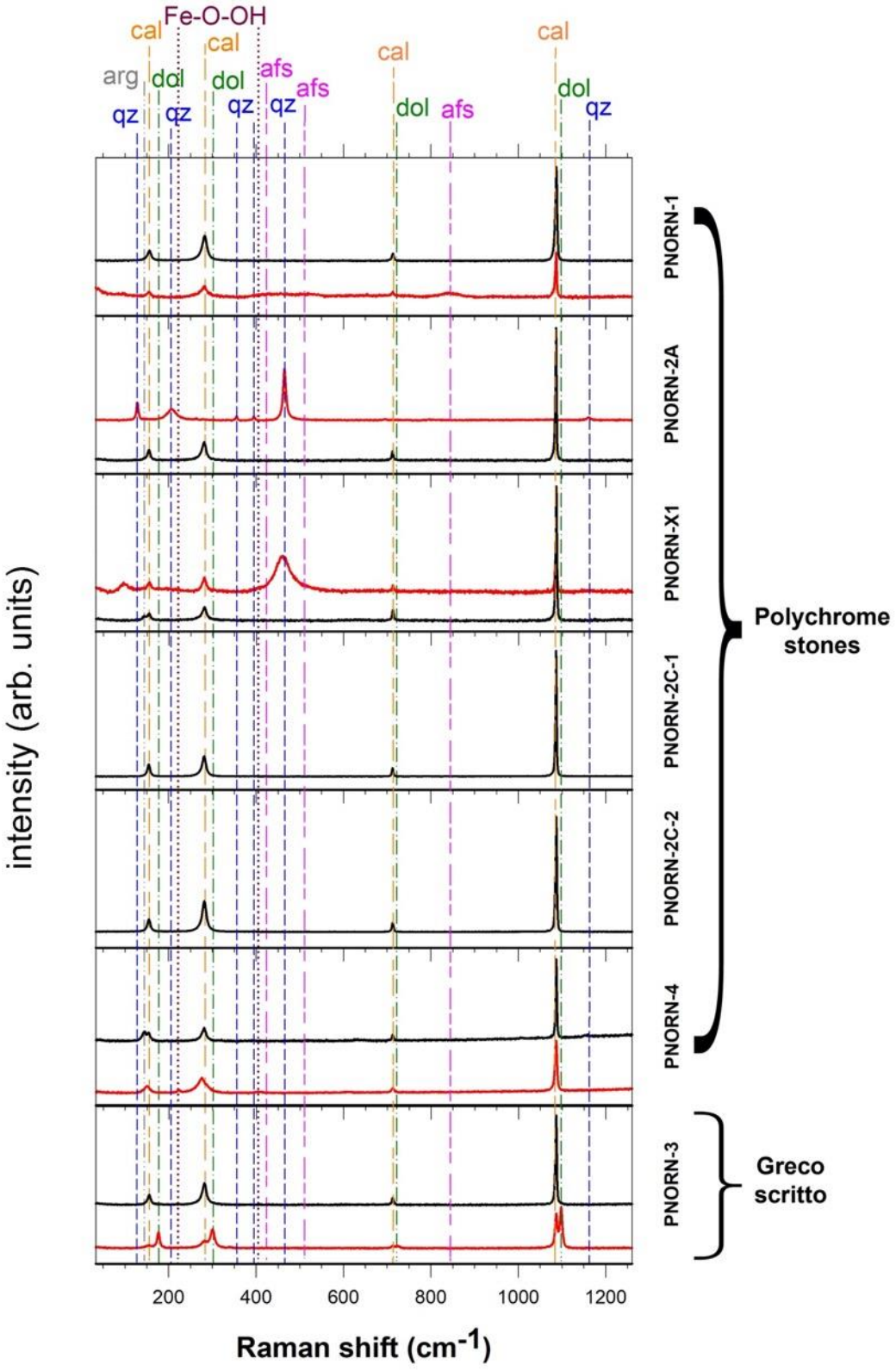

Fig. S3 Selected representative Raman spectra in the 100-1250 cm^{-1} region. For each marble sample, the most representative patterns are reported along with the position of the most intense Raman vibration: cal = calcite; dol = dolomite; arg = aragonite; qz = quartz; afs = alkali feldspar; Fe-O-OH = Fe oxide/hydroxide

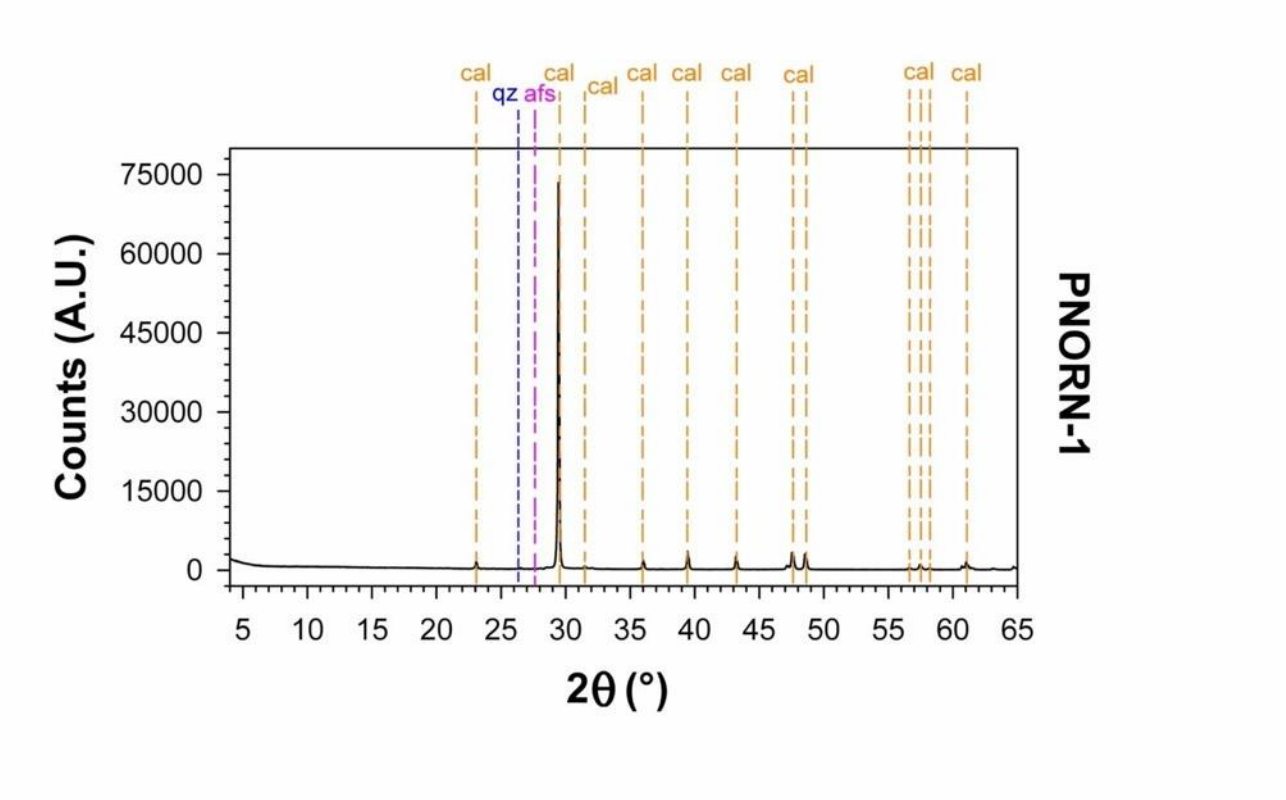

Fig. S4 XRPD pattern of the sample PNORN-1. Vertical coloured lines indicate the position of the most intense Bragg reflections of cal = calcite, qz = quartz, afs = alkali feldspar.

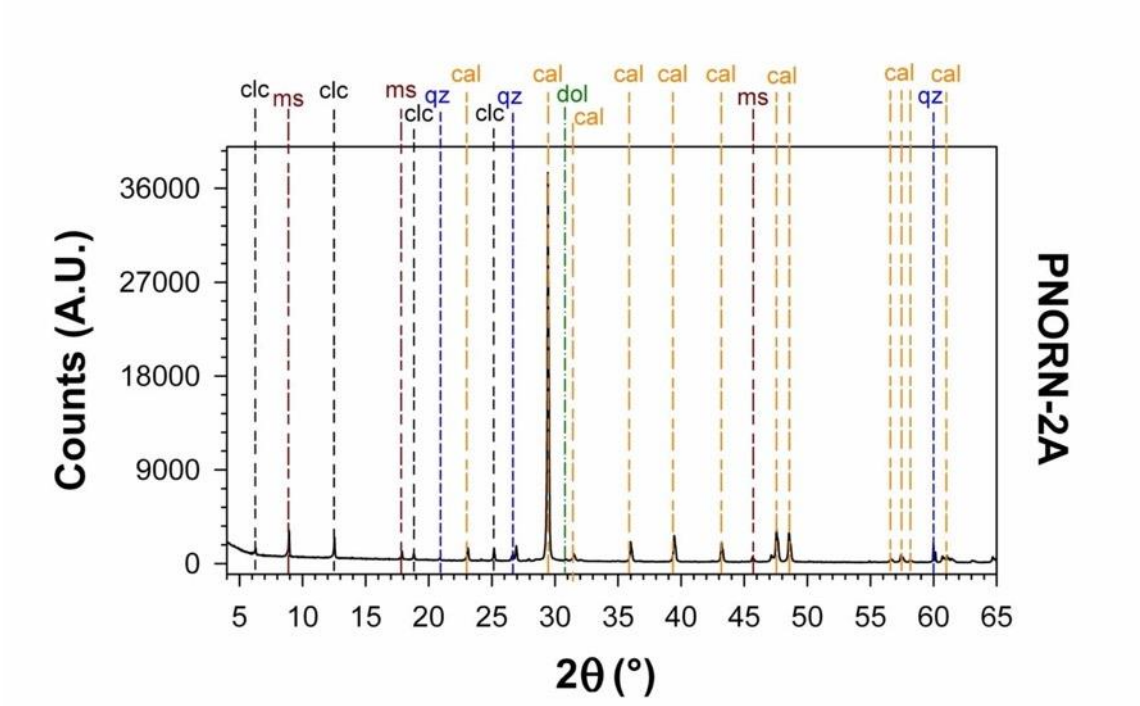

Fig. S5 XRPD pattern of the sample PNORN-2A. Vertical coloured lines indicate the position of the most intense Bragg reflections of cal = calcite, dol = dolomite, qz = quartz, ms = muscovite, clc = clinochlore

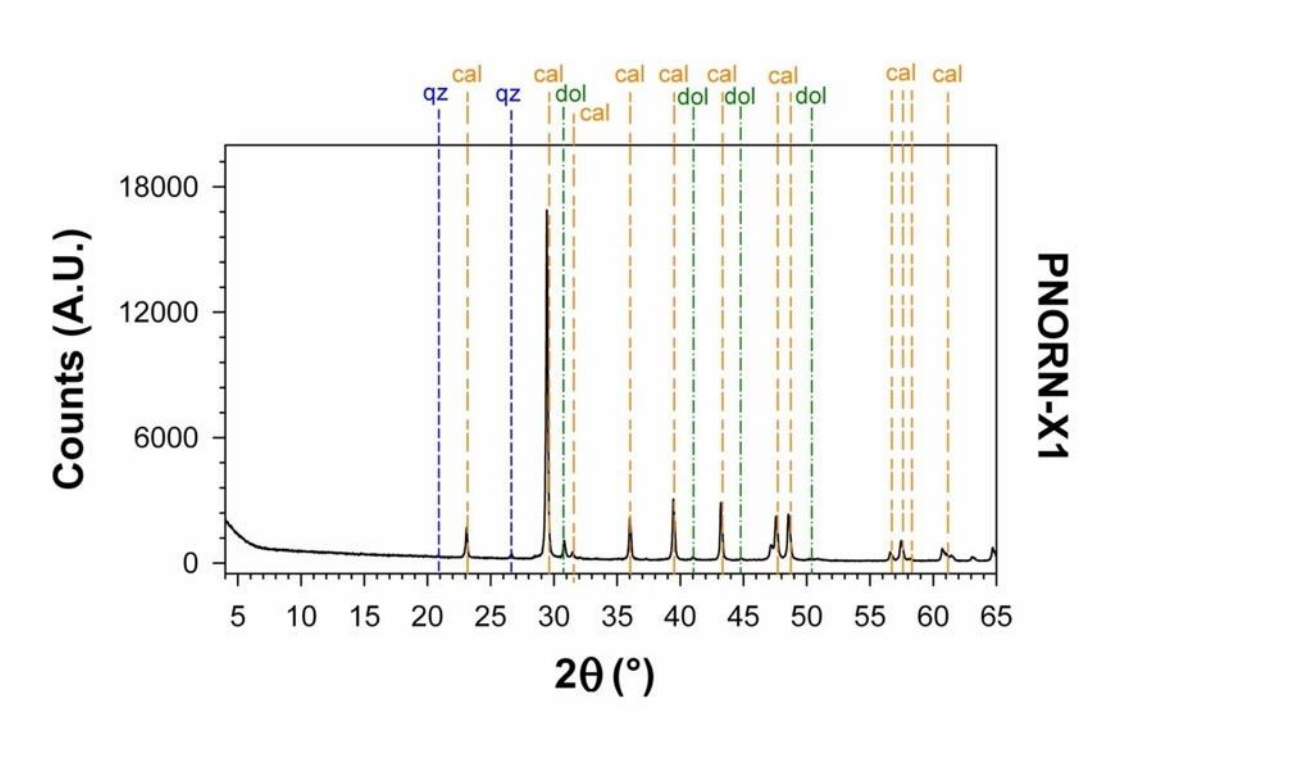

Fig. S6 XRPD pattern for the sample PNORN-X1. Vertical coloured lines indicate the position of the most intense Bragg reflections of cal = calcite, dol = dolomite, qz = quartz.

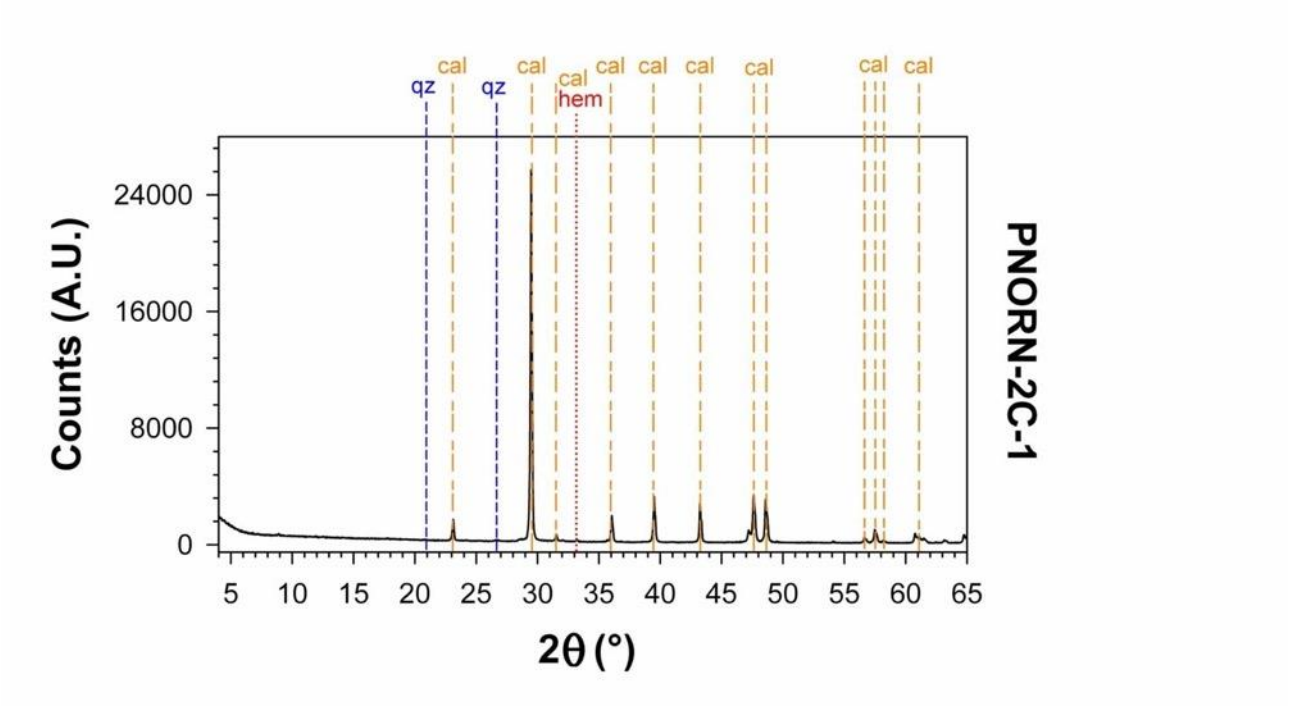

Fig. S7 XRPD pattern of the sample PNORN-2C-1. Vertical coloured lines indicate the position of the most intense Bragg reflections of cal = calcite, hem = hematite, qz = quartz

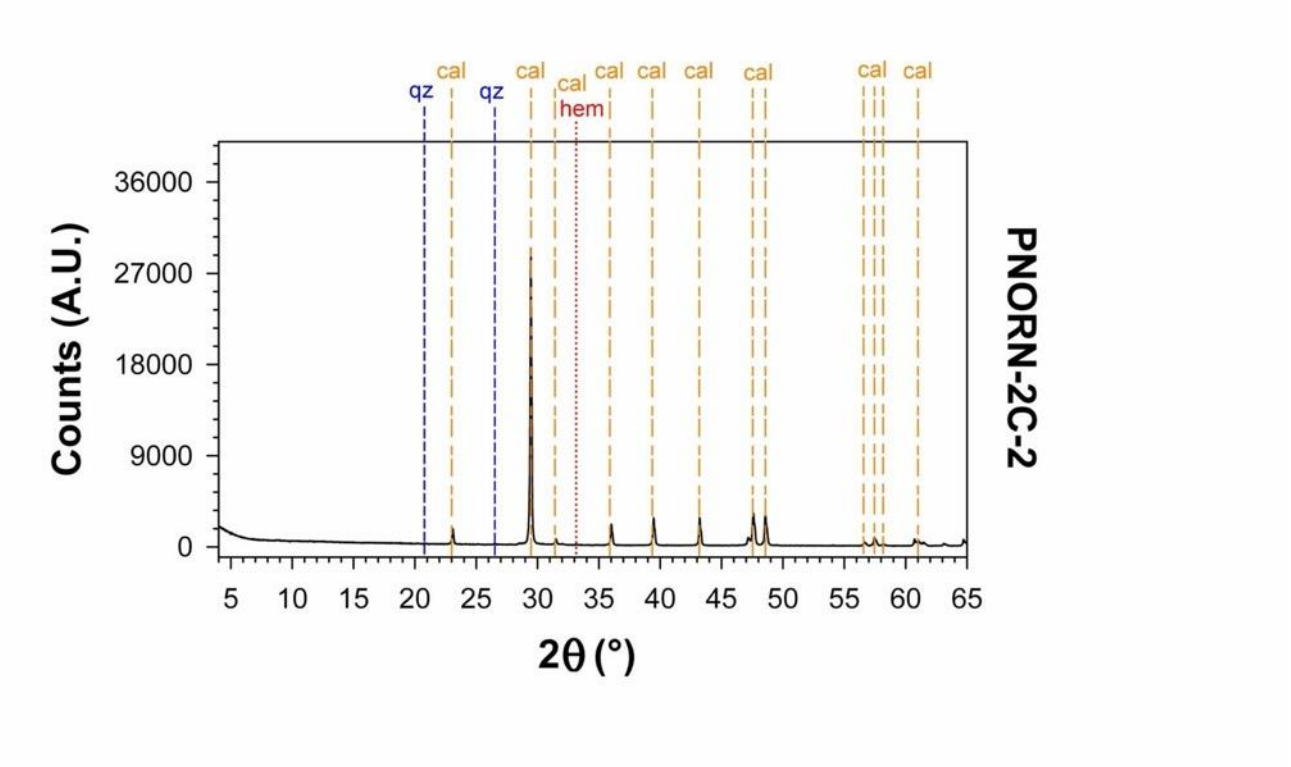

Fig. S8 XRPD pattern of the sample PNORN-2C-2. Vertical coloured lines indicate the position of the most intense Bragg reflections of cal = calcite, hem = hematite, qz = quartz

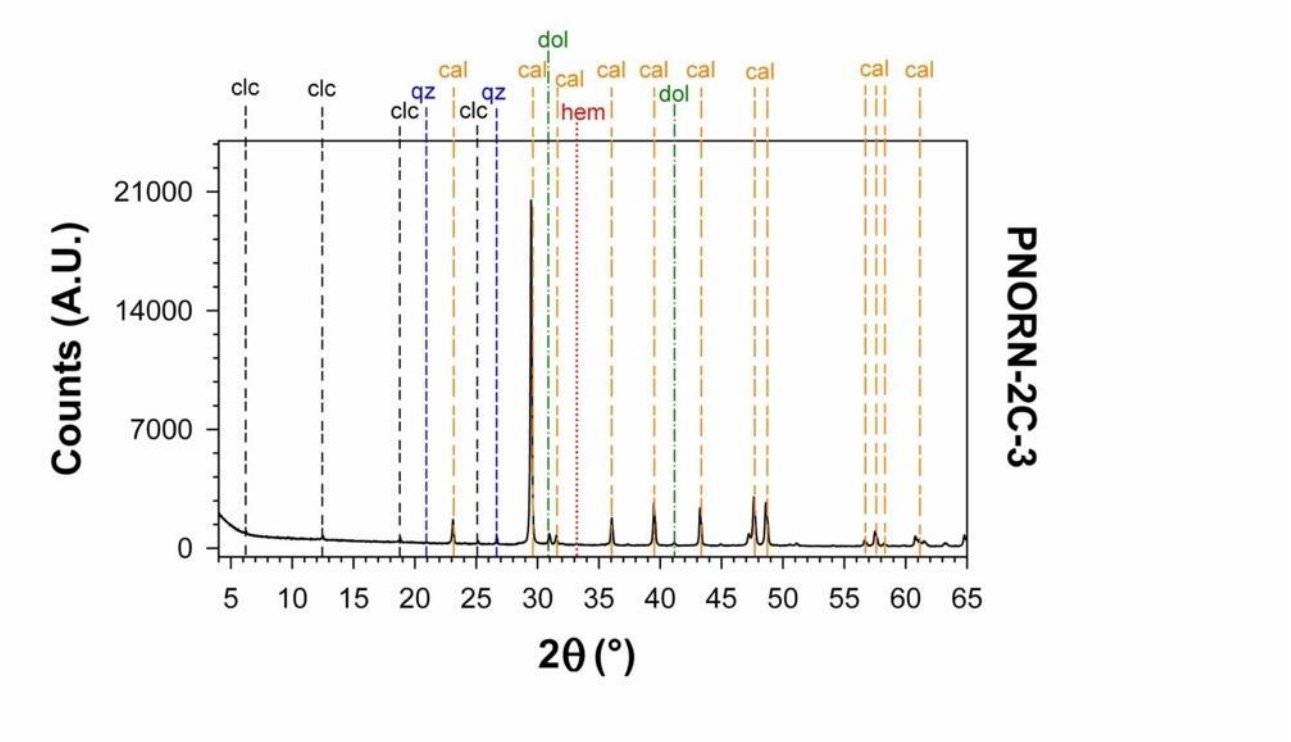

Fig. S9 XRPD pattern for the sample PNORN-2C-3. Vertical coloured lines indicate the position of the most intense Bragg reflections of cal = calcite, dol = dolomite, hem = hematite, qz = quartz, clc = clinochlore

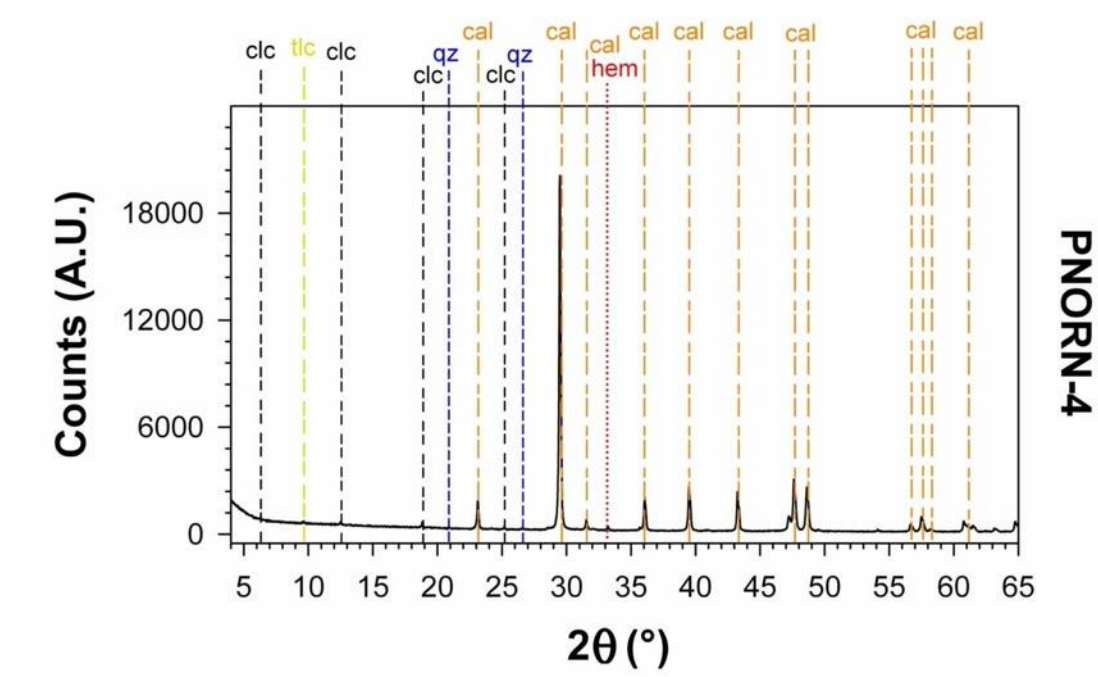

Fig. S10 XRPD pattern for the sample PNORN-4. Vertical coloured lines indicate the position of the most intense Bragg reflections of cal = calcite, hem = hematite, qz = quartz, tlc = talc, clc = clinochlore

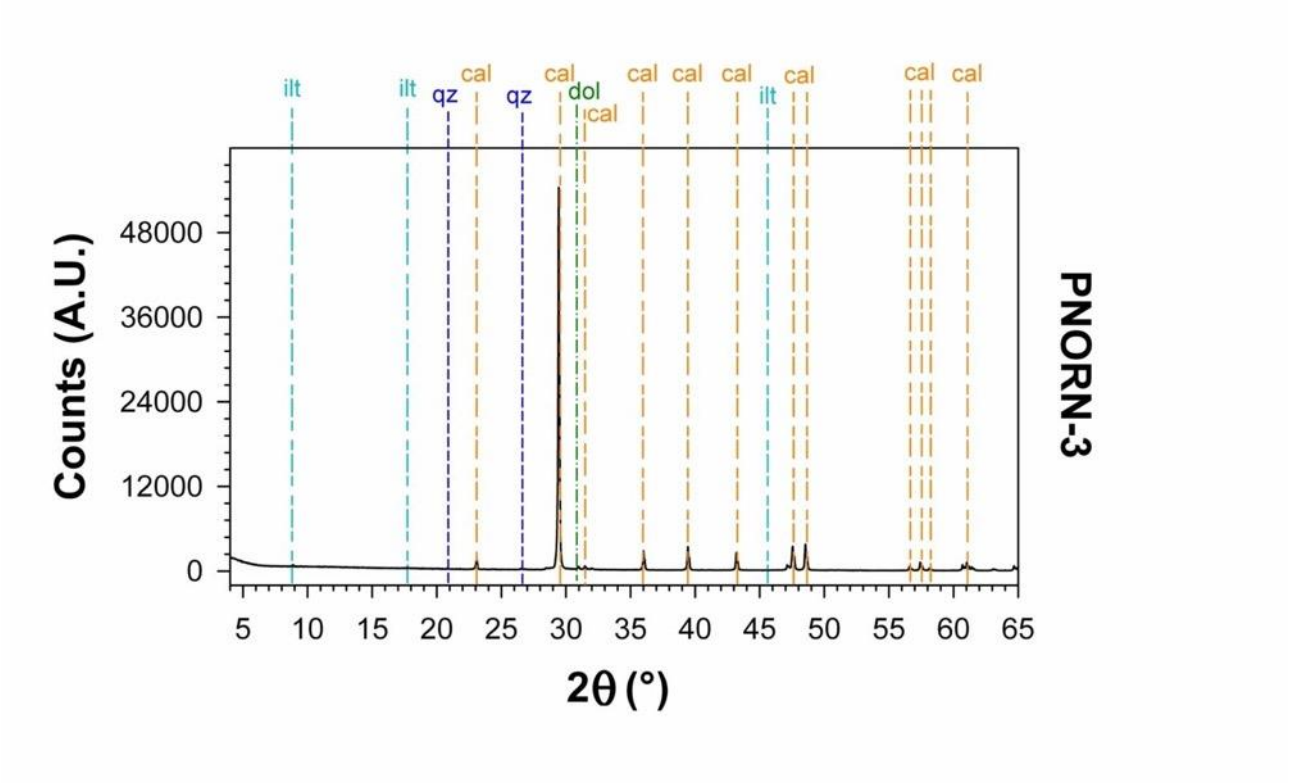

Fig. S11 XRPD pattern for the sample PNORN-3. Vertical coloured lines indicate the position of the most intense Bragg reflections: cal = calcite, dol = dolomite, ilt = illite, qz= quartz

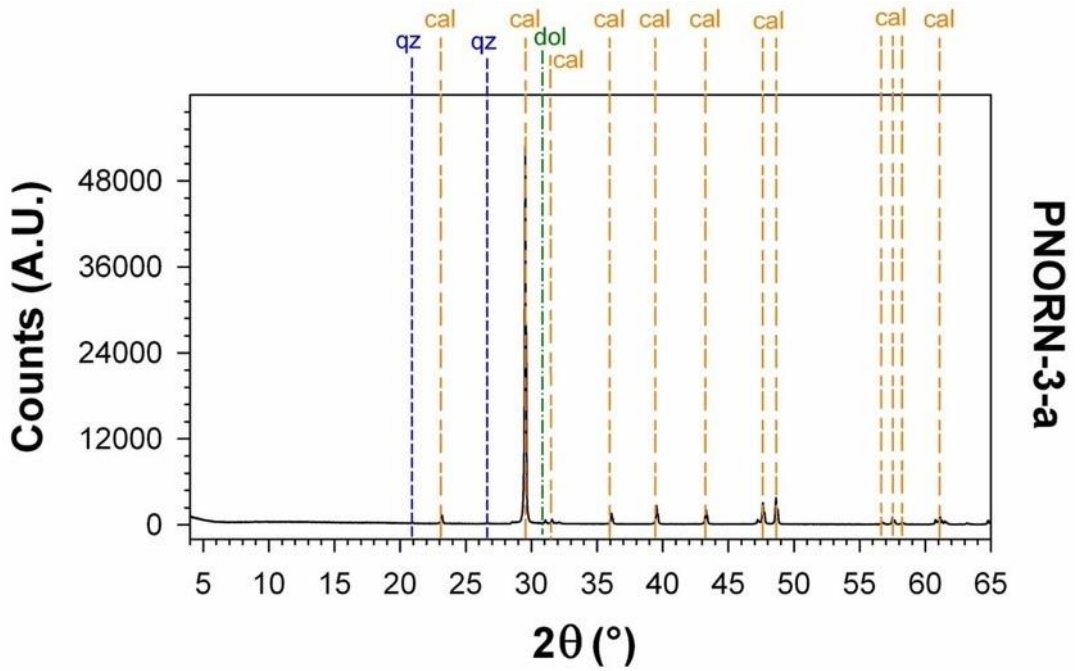

Fig. S12 XRPD pattern for the sample PNORN-3-a. Vertical coloured lines indicate the position of the most intense Bragg reflections: cal = calcite, dol = dolomite, qz= quartz

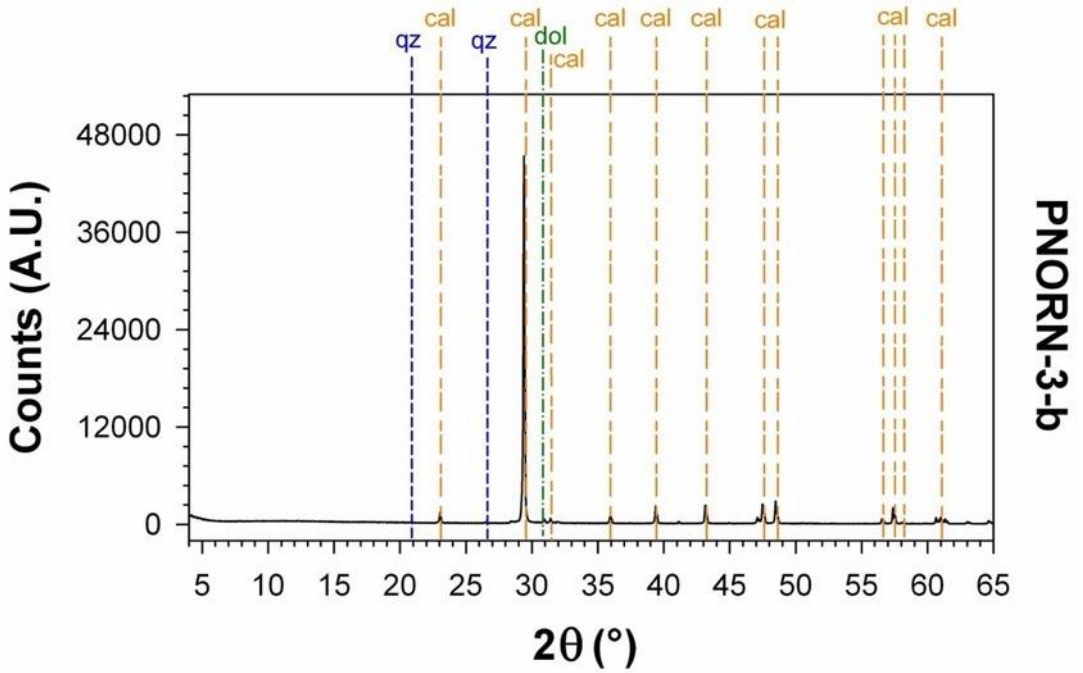

Fig. S13 XRPD pattern for the sample PNORN-3-b. Vertical coloured lines indicate the position of the most intense Bragg reflections: cal = calcite, dol = dolomite, qz= quartz

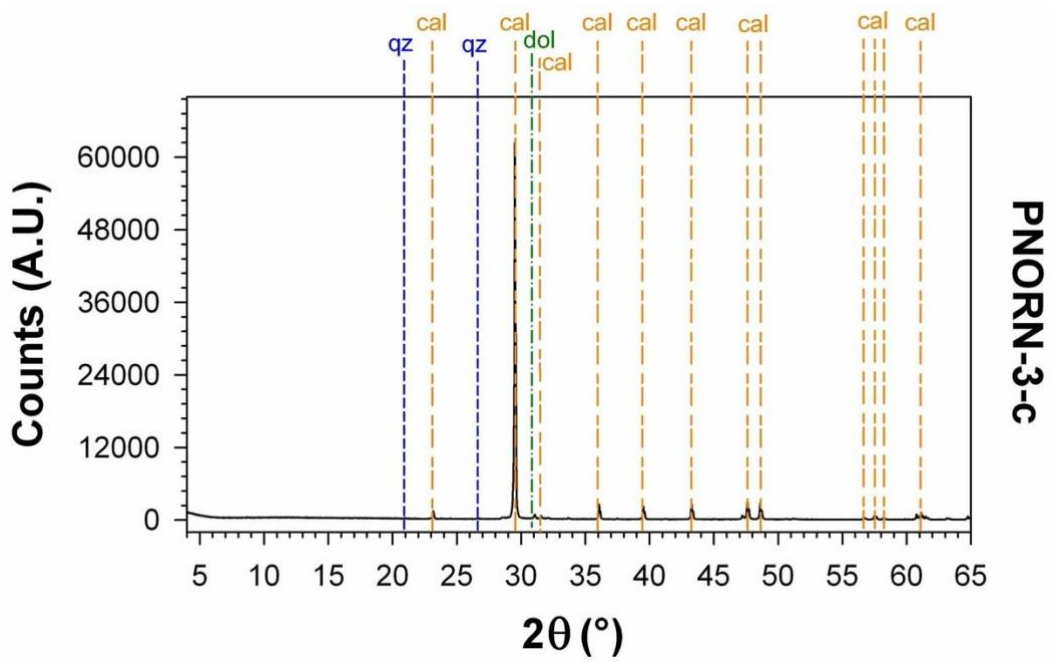

Fig. S14 XRPD pattern for the sample PNORN-3-c. Vertical coloured lines indicate the position of the most intense Bragg reflections: cal = calcite, dol = dolomite, qz= quartz

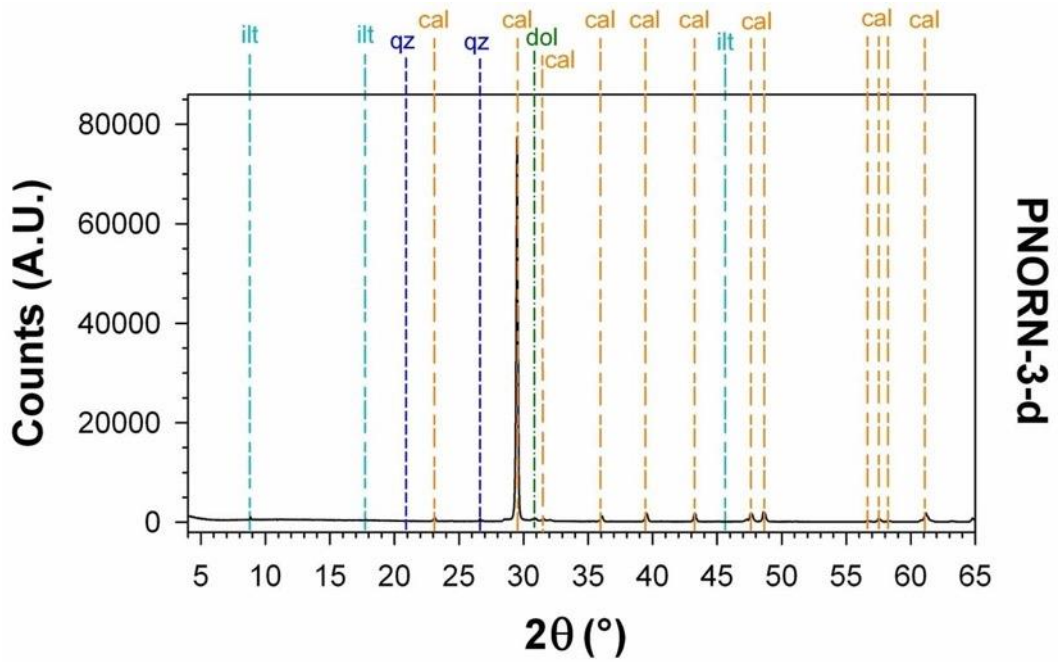

Fig. S15 XRPD pattern for the sample PNORN-3-d. Vertical coloured lines indicate the position of the most intense Bragg reflections: cal = calcite, dol = dolomite, ilt = illite, qz= quartz

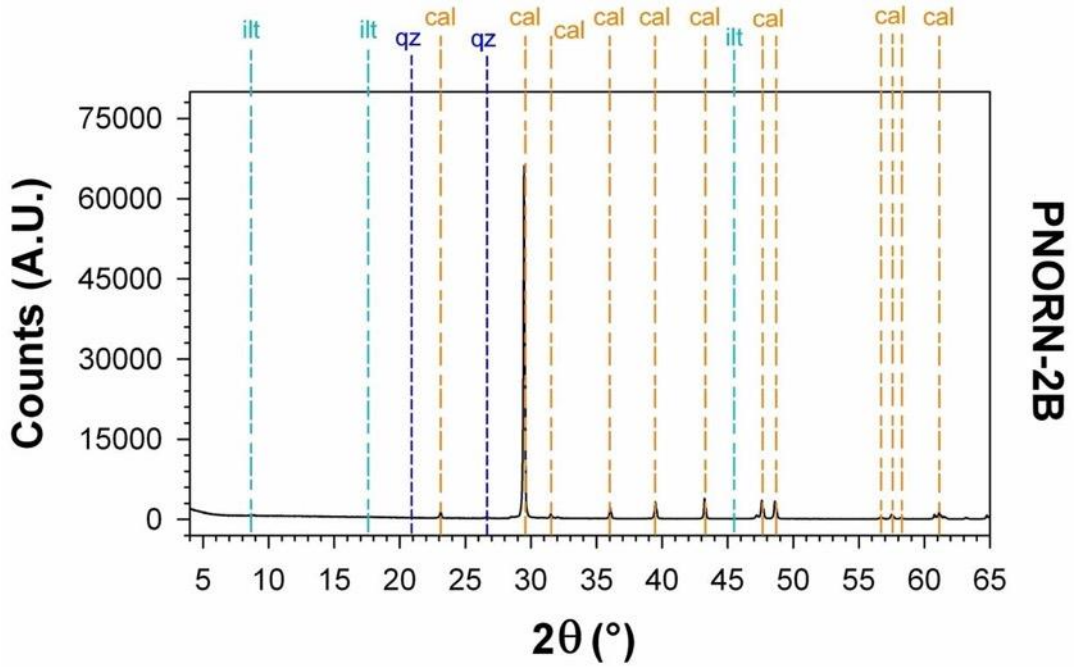

Fig. S16 XRPD pattern for the sample PNORN-2B. Vertical coloured lines indicate the position of the most intense Bragg reflections: cal = calcite, qz = quartz, ilt = illite

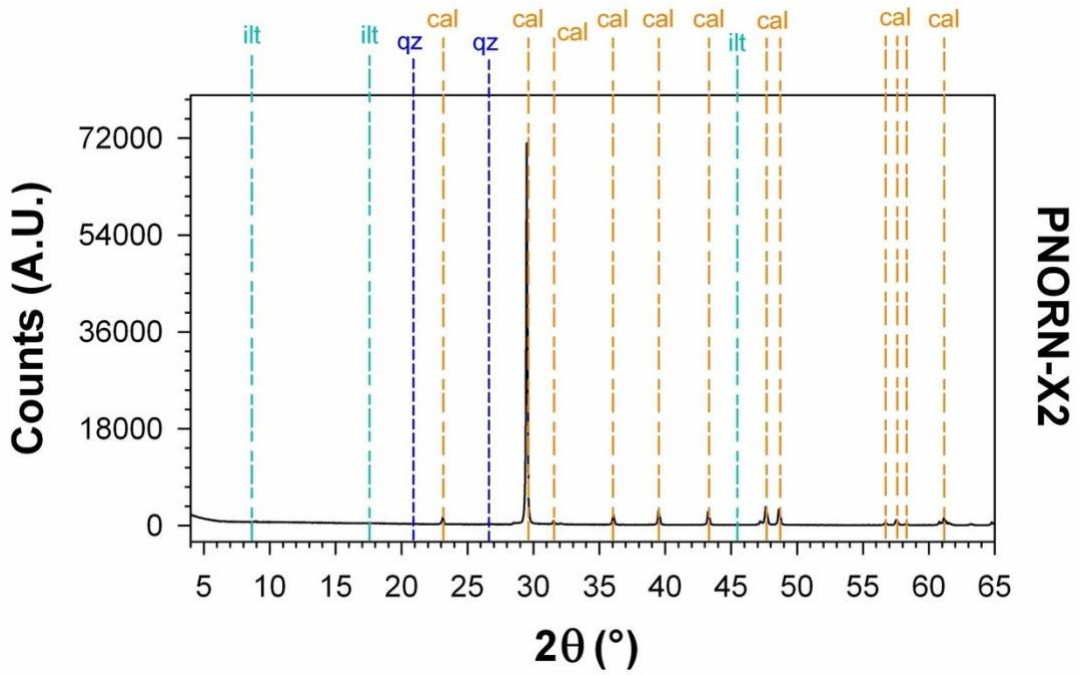

Fig. S17 XRPD pattern for the sample PNORN-X2. Vertical coloured lines indicate the position of the most intense Bragg reflections: cal = calcite, qz = quartz, ilt = illite

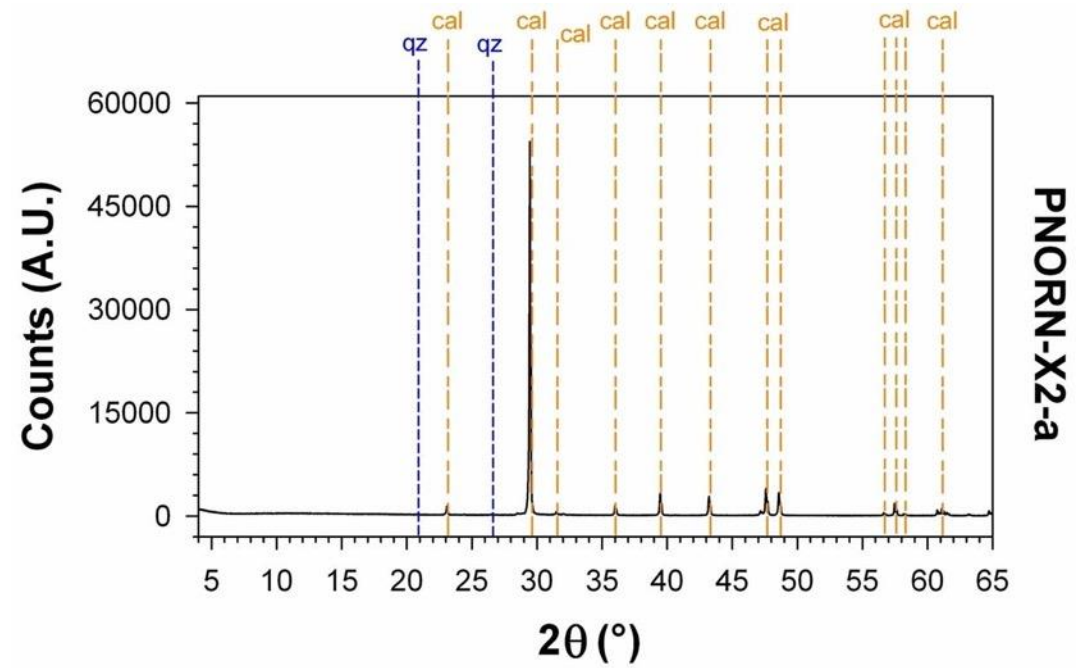

Fig. S18 XRPD pattern for the sample PNORN-X2-a. Vertical coloured lines indicate the position of the most intense Bragg reflections: cal = calcite, qz = quartz

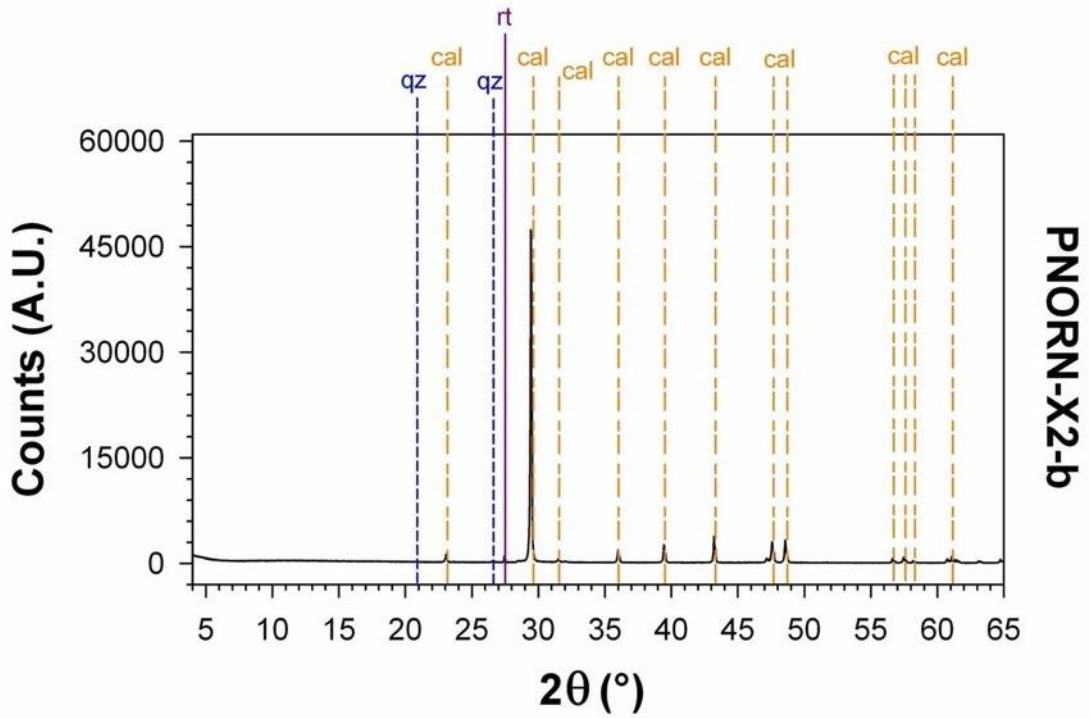

Fig. S19 XRPD pattern for the sample PNORN-X2-b. Vertical coloured lines indicate the position of the most intense Bragg reflections: cal = calcite, qz = quartz, rt= rutile

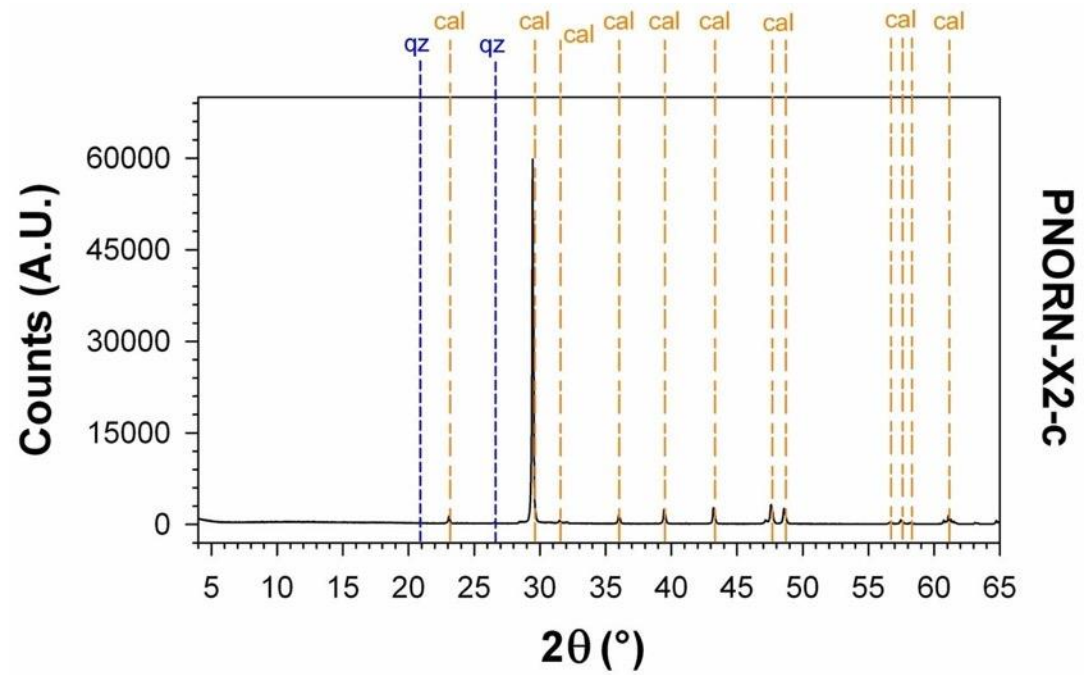

Fig. S20 XRPD pattern for the sample PNORN-X2-c. Vertical coloured lines indicate the position of the most intense Bragg reflections: cal = calcite, qz = quartz

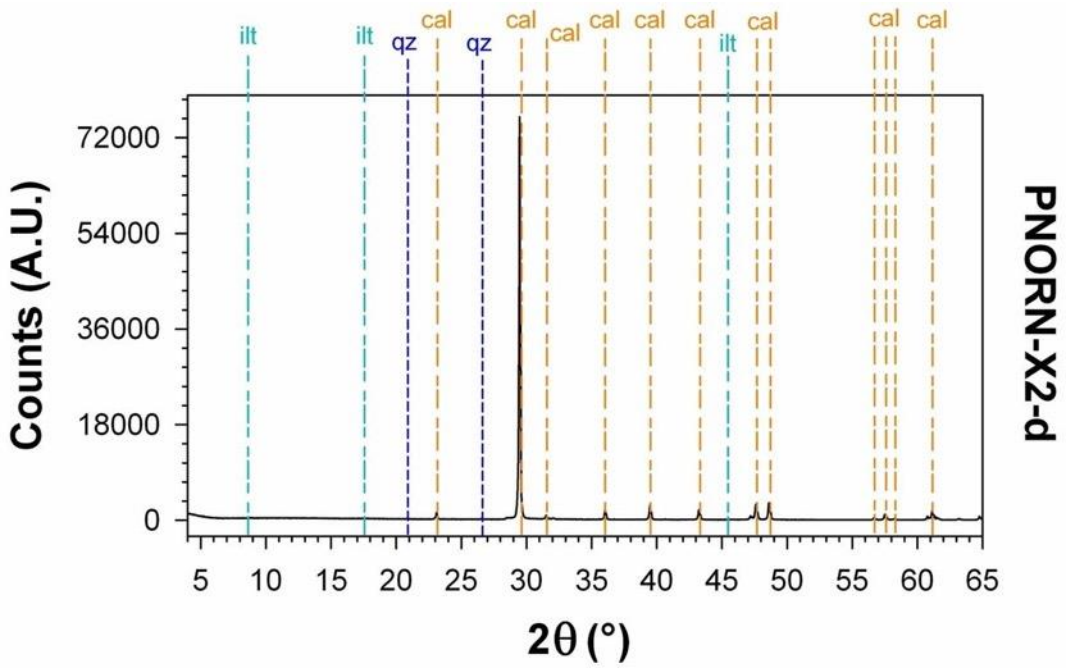

Fig. S21 XRPD pattern for the sample PNORN-X2-d. Vertical coloured lines indicate the position of the most intense Bragg reflections: cal = calcite, qz = quartz, ilt = illite

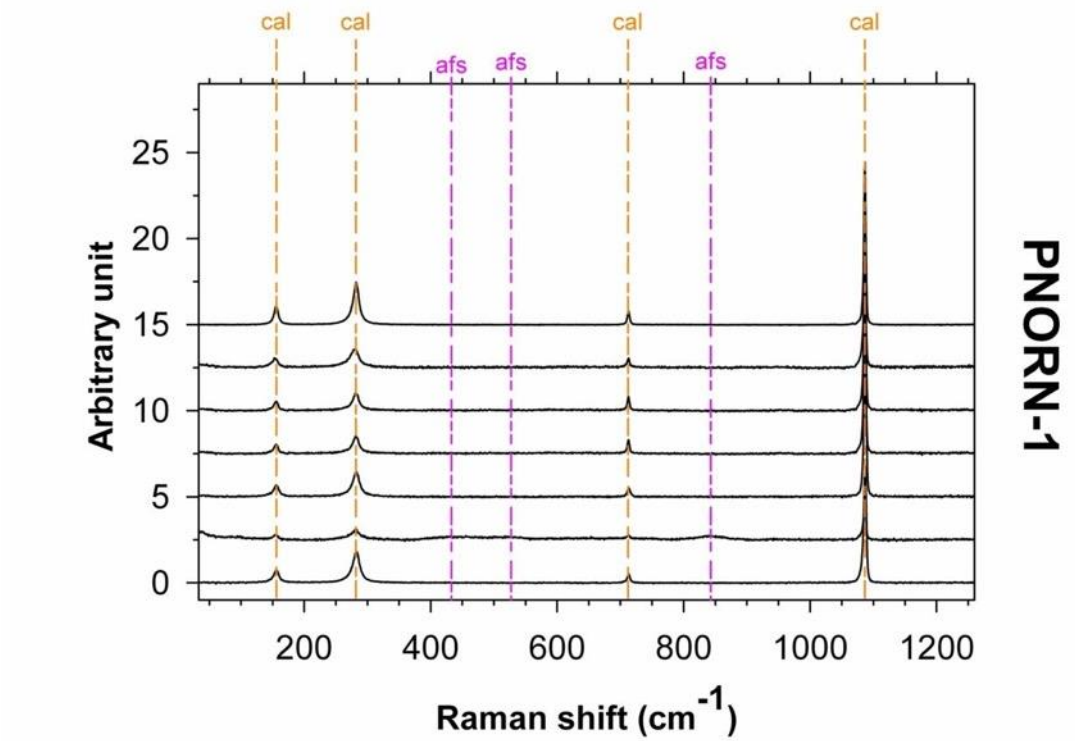

Fig. S22 Collected Raman spectra in the 100-1250 cm^{-1} region for the PNORN-1 sample. The position of the most intense Raman vibrations is reported of cal = calcite; afs = alkali feldspar

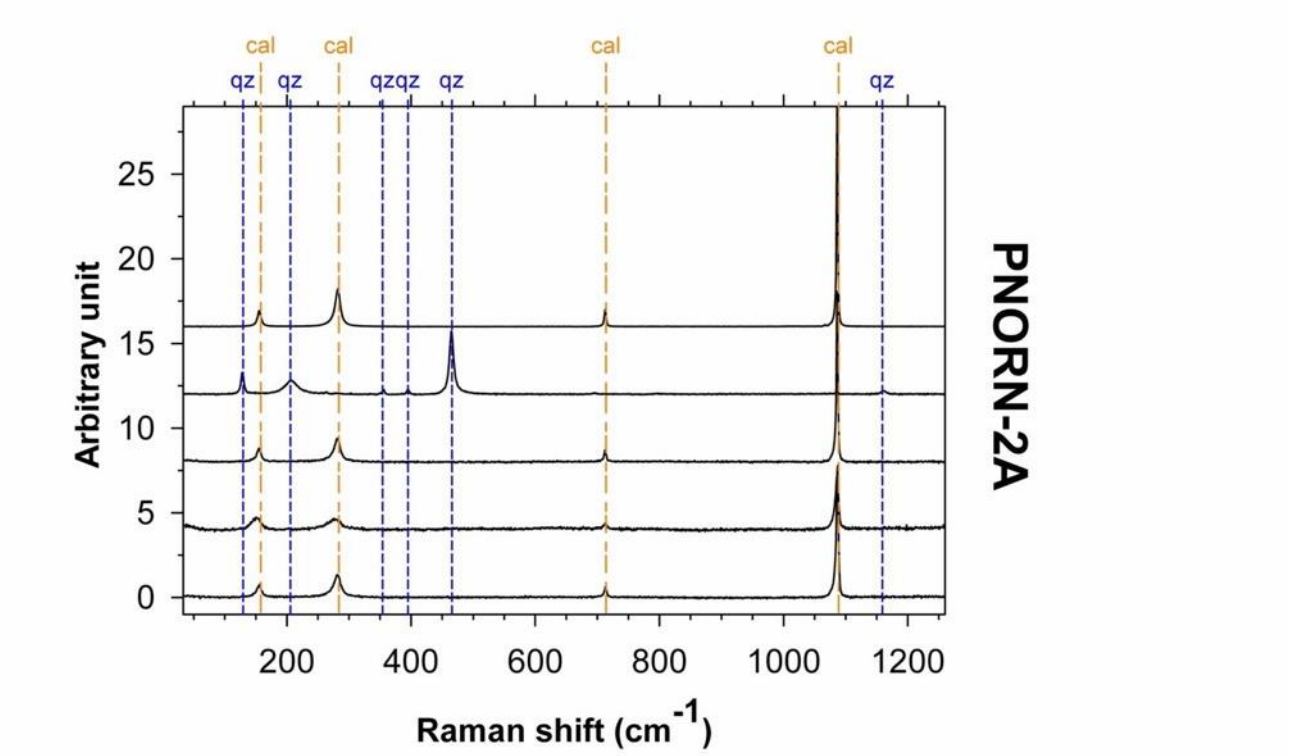

Fig. S23 Collected Raman spectra in the 100-1250 cm^{-1} region for PNORN-2A sample. The position of the most intense Raman vibrations is reported of cal = calcite; qz = quartz

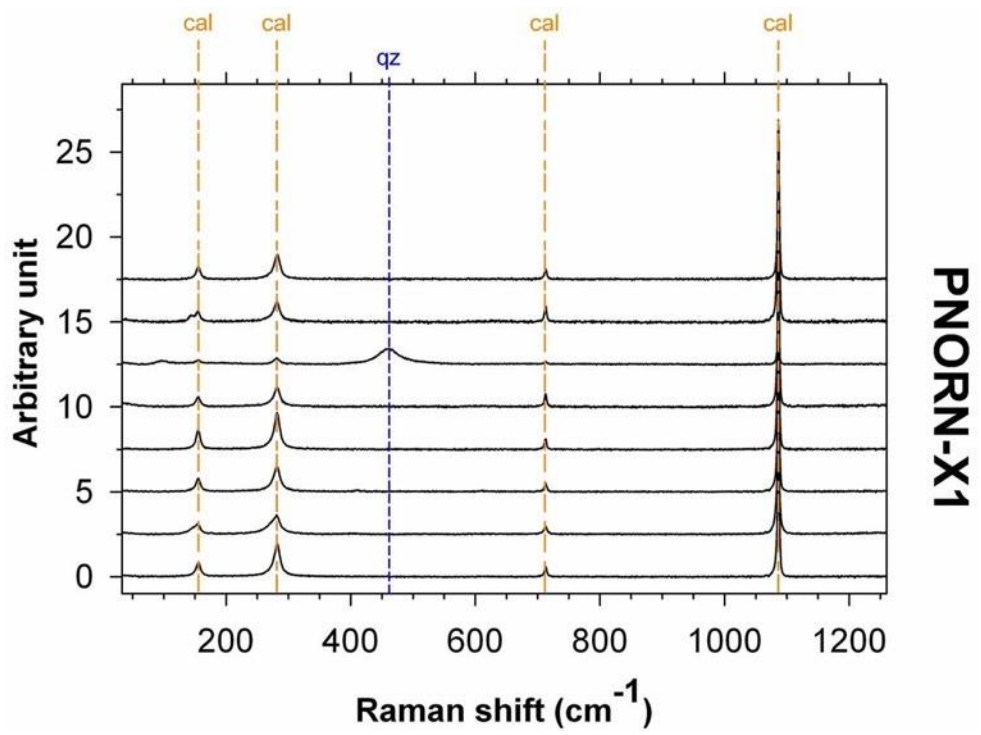

Fig. S24 Collected Raman spectra in the 100-1250 cm^{-1} region for PNORN-X1 sample. The position of the most intense Raman vibrations is reported of cal = calcite; qz = quartz

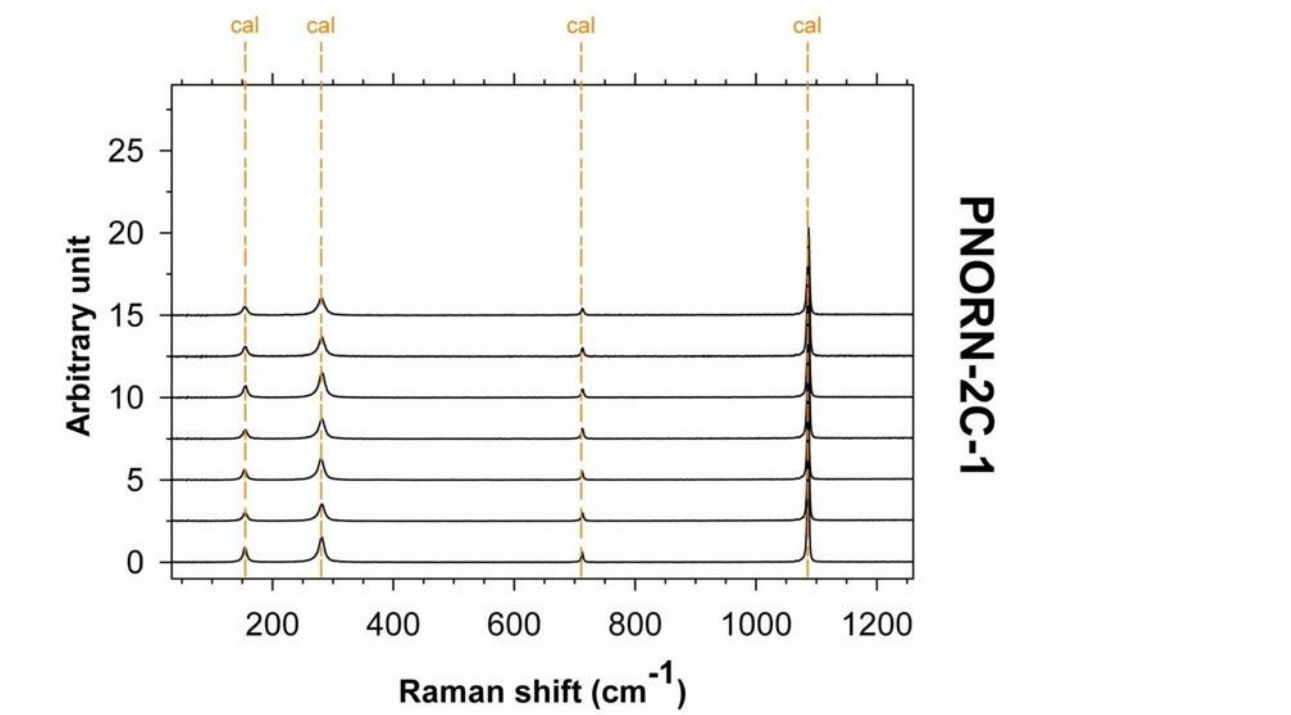

Fig. S25 Collected Raman spectra in the 100-1250 cm^{-1} region for PNORN-2C-1 sample. The position of the most intense Raman vibrations is reported of cal = calcite

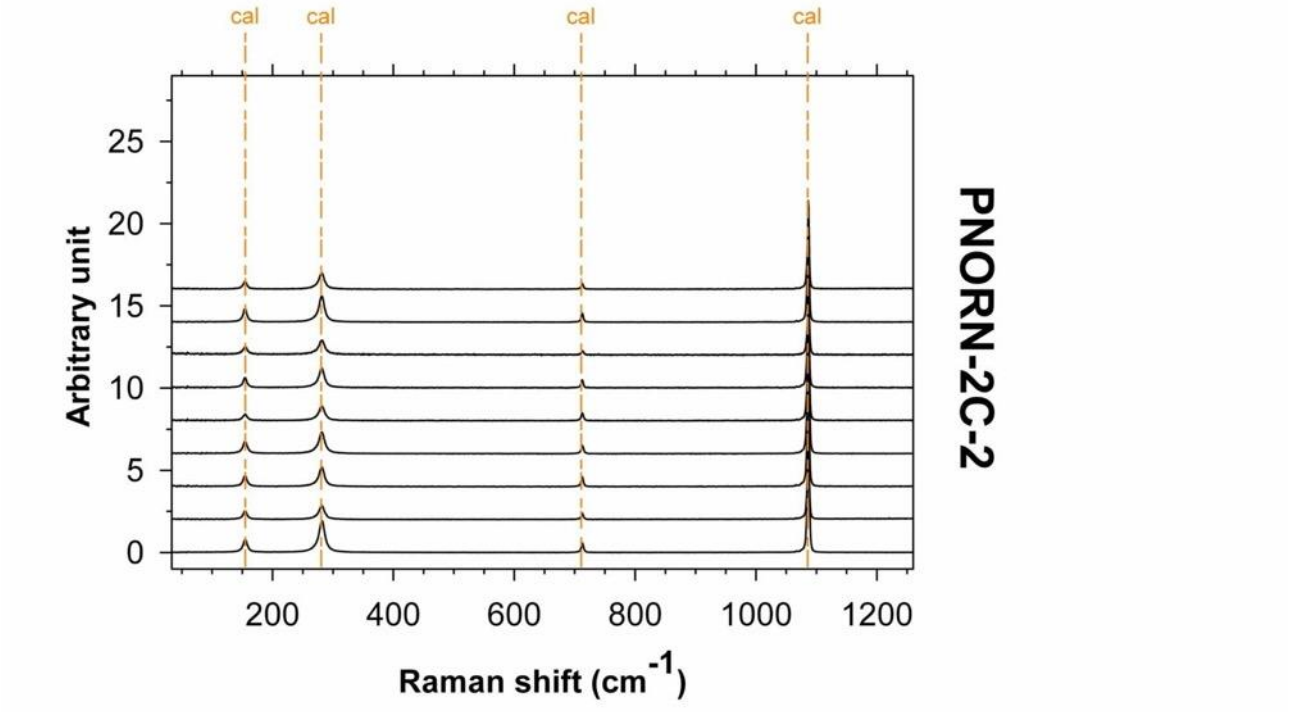

Fig. S26 Collected Raman spectra in the 100-1250 cm^{-1} region for PNORN-2C-2 sample. The position of the most intense Raman vibrations is reported of cal = calcite

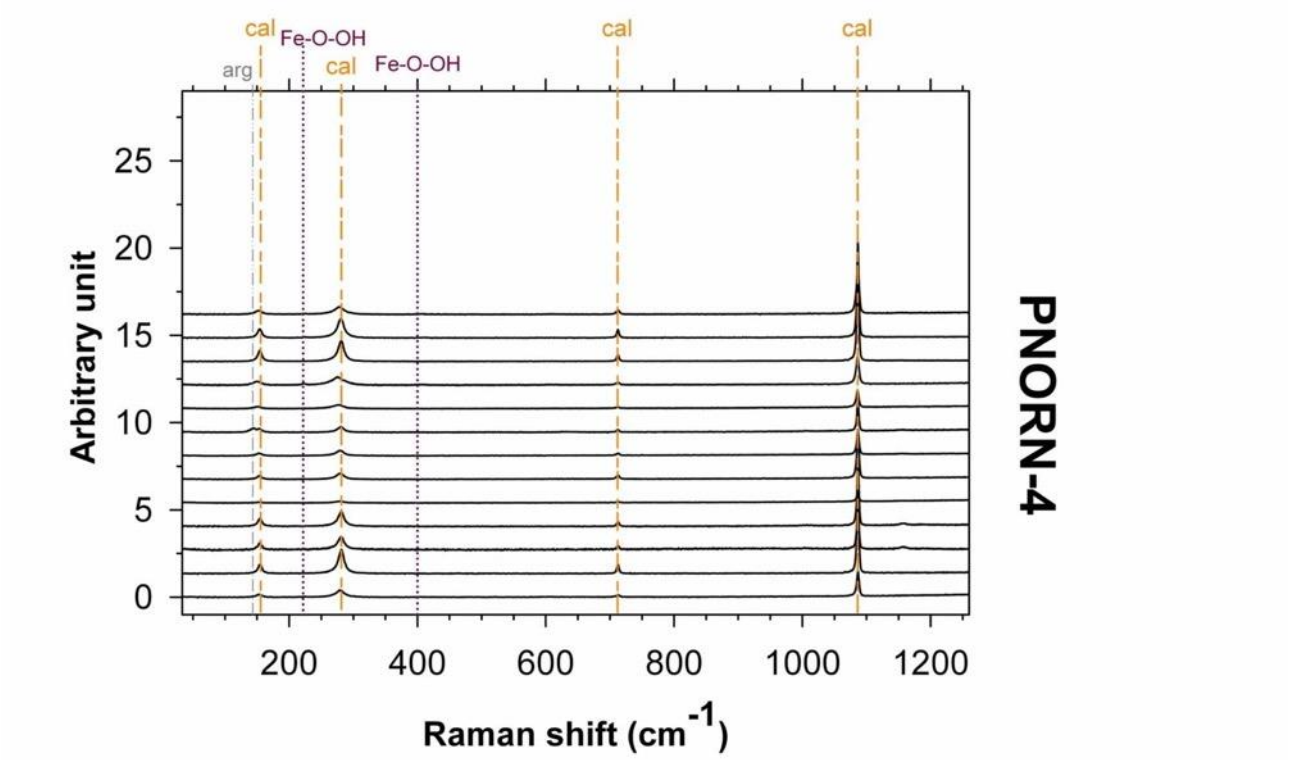

Fig. S27 Collected Raman spectra in the 100-1250 cm^{-1} region for PNORN-4 sample. The position of the most intense Raman vibrations is reported of cal = calcite, arg = aragonite; Fe-O-OH = Fe-oxide/hydroxide

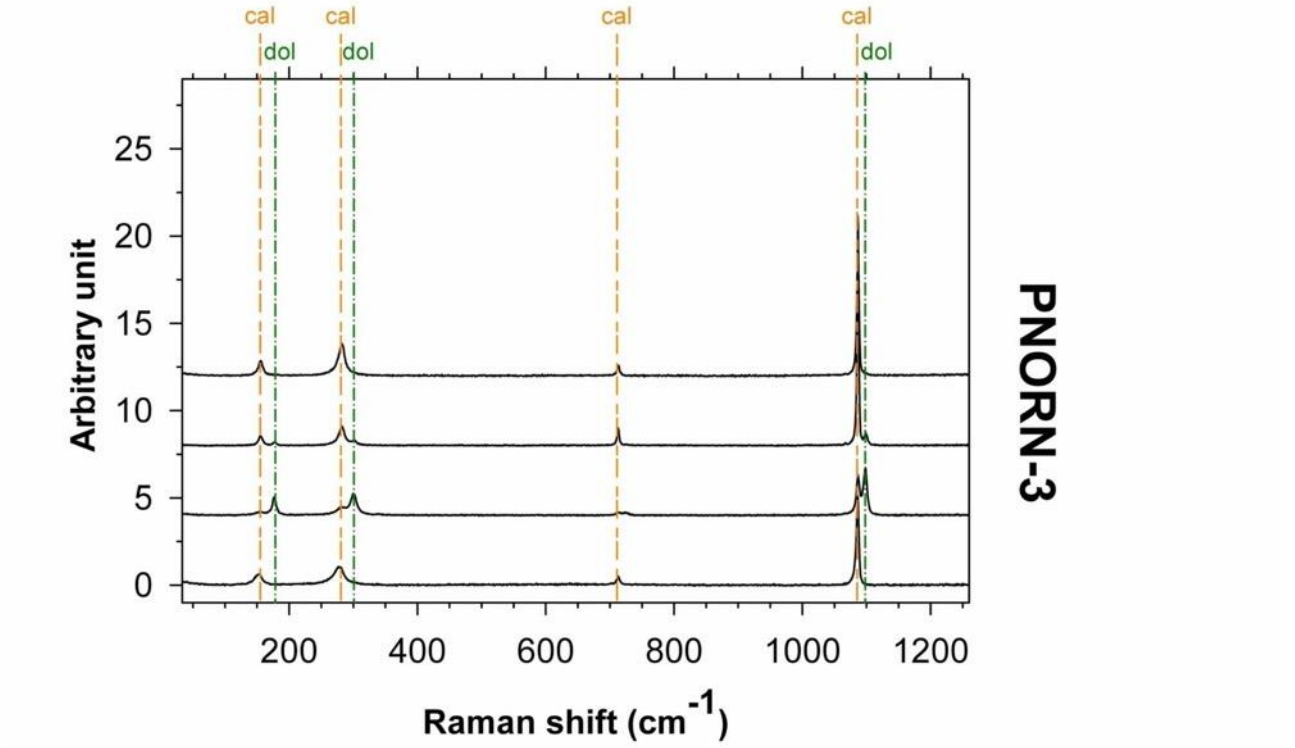

Fig. S28 Collected Raman spectra in the 100-1250 cm^{-1} region for PNORN-3 sample. The position of the most intense Raman vibrations is reported: cal = calcite; dol = dolomite