Arsenic(III)-Oxide Intercalates with Potassium Chloride: Water-Induced Varieties and New Synthesis Methods

Supporting Information

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Table S1. Qualitative description of mechanochemical studies results.

reactants (molar ratio)	arsenolite + KCl (1:1)	arsenolite + KCl (1:2)	claudetite II+ KCl (1:1)
no solution	no reaction	no reaction	no reaction
distilled water	no reaction	no reaction	intercalate $\mathbf{X_{KCl}}$, low yield, pronounced effect of time on reaction yield
CH_3COOK aqueous solution	intercalate $\mathbf{P_{KCl}}$, medium yield	intercalate $\mathbf{P_{KCl}}$, low yield	intercalate $\mathbf{P_{KCl}}$, high conversion of claudetite II
K_2HPO_4 aqueous solution	intercalate $\mathbf{X_{KCl}}$, medium yield	intercalate $\mathbf{X_{KCl}}$, low yield	intercalate $\mathbf{P_{KCl}}$, high conversion of claudetite II

Table S2. Qualitative description of the stability of the mechanochemical reaction products in the ambient conditions (or during drying)

reactants (molar ratio)	arsenolite + KCl (1:1)	arsenolite + KCl (1:2)	claudetite II+ KCl (1:1)
distilled water	no products	no products	the product decomposed to claudetite II, arsenolite and KCl
CH_3COOK aqueous solution	intercalate $\mathbf{P_{KCl}}$, medium yield	intercalate $\mathbf{P_{KCl}}$, low yield	further reaction, large quantity of $\mathbf{Y_{KCl}}$ intercalate plus remaining compound $\mathbf{P_{KCl}}$
K_2HPO_4 aqueous solution	intercalate $\mathbf{X_{KCl}}$ decomposed to intercalate $\mathbf{Y_{KCl}}$ completely after 5 days	after drying at 40 °C for 3 h the product formed unknown phase $\mathbf{Z_{KCl}}$ which was stable	after drying at 80 °C for 1 h the product formed unknown phase $\mathbf{Z_{KCl}}$ which was stable

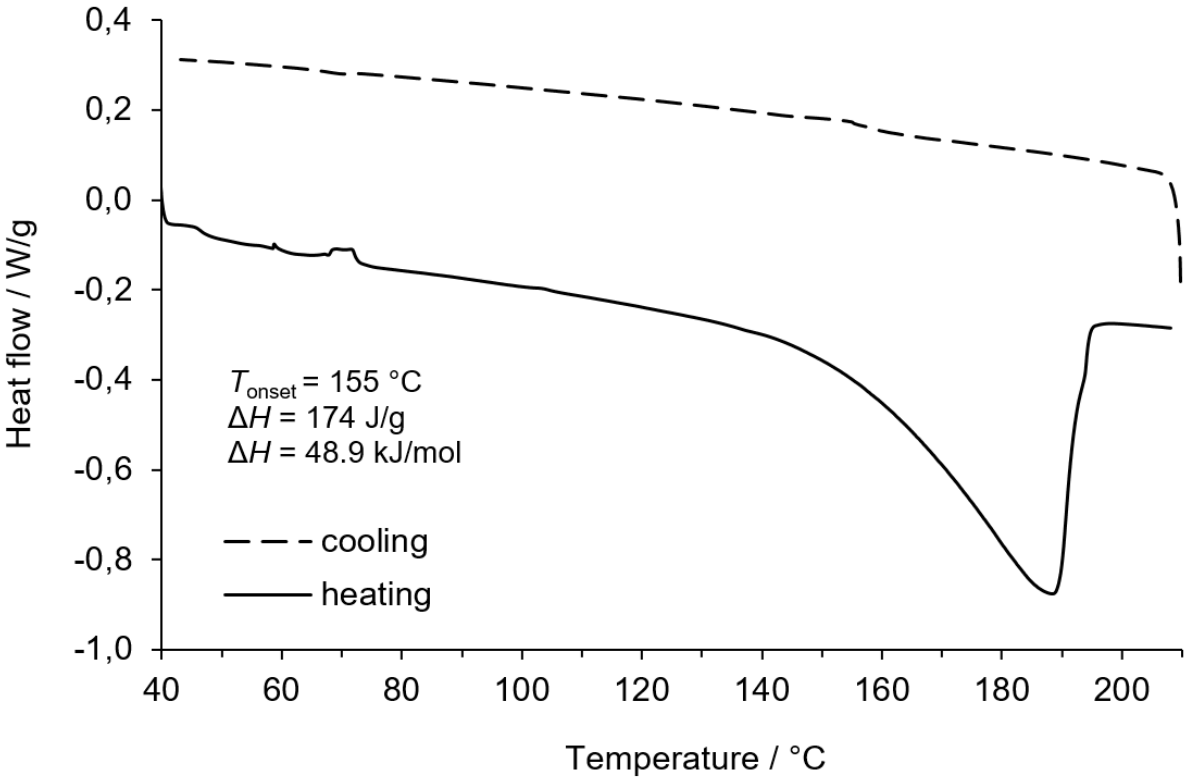

Figure S1. Differential scanning calorimetry (DSC) curve for intercalate $\mathbf{Y_{KCl}}$. DSC experiment was carried out from 40 °C to 210 °C with a heating rate of 5 °C/min and cooling rate of 10 °C/min.

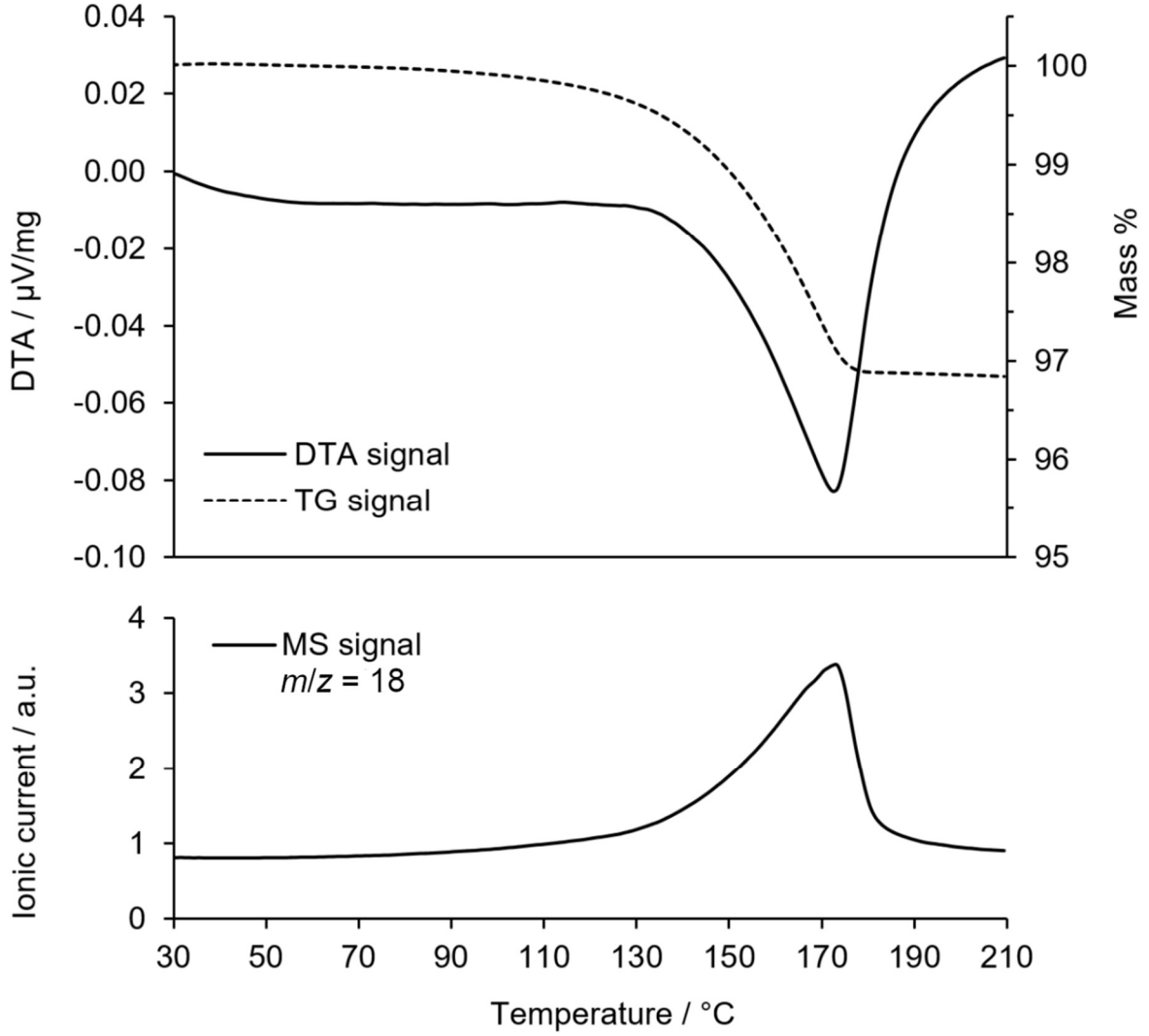

Figure S2. Differential thermal analysis and thermogravimetric curve for intercalate **Y_{KCl}** (top) together with the mass spectrometry signal of m/z = 18 corresponding to water (bottom) plotted as a function of temperature.

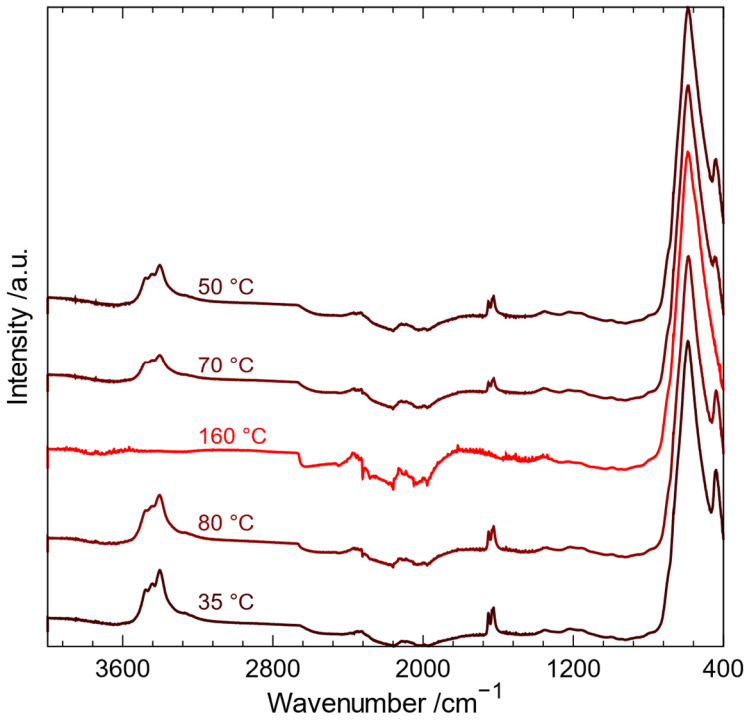

Figure S3. ATR-FTIR spectra of intercalate $\mathbf{Y_{KCl}}$ recorded at various temperatures as indicated by labels plotted next to the spectra.

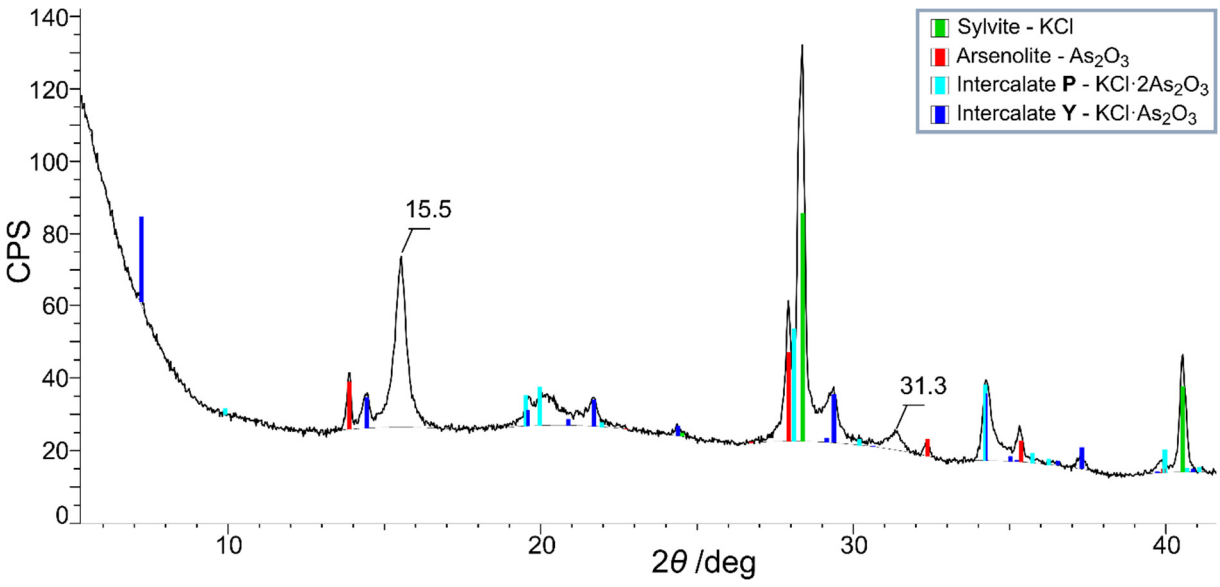

Figure S4. Powder X-ray diffraction pattern of showing the reflection of the unknown phase $\mathbf{Z_{KCl}}$ (at 15.5° and 31.3°) in addition to reflections of other compounds present in the reaction mixture.

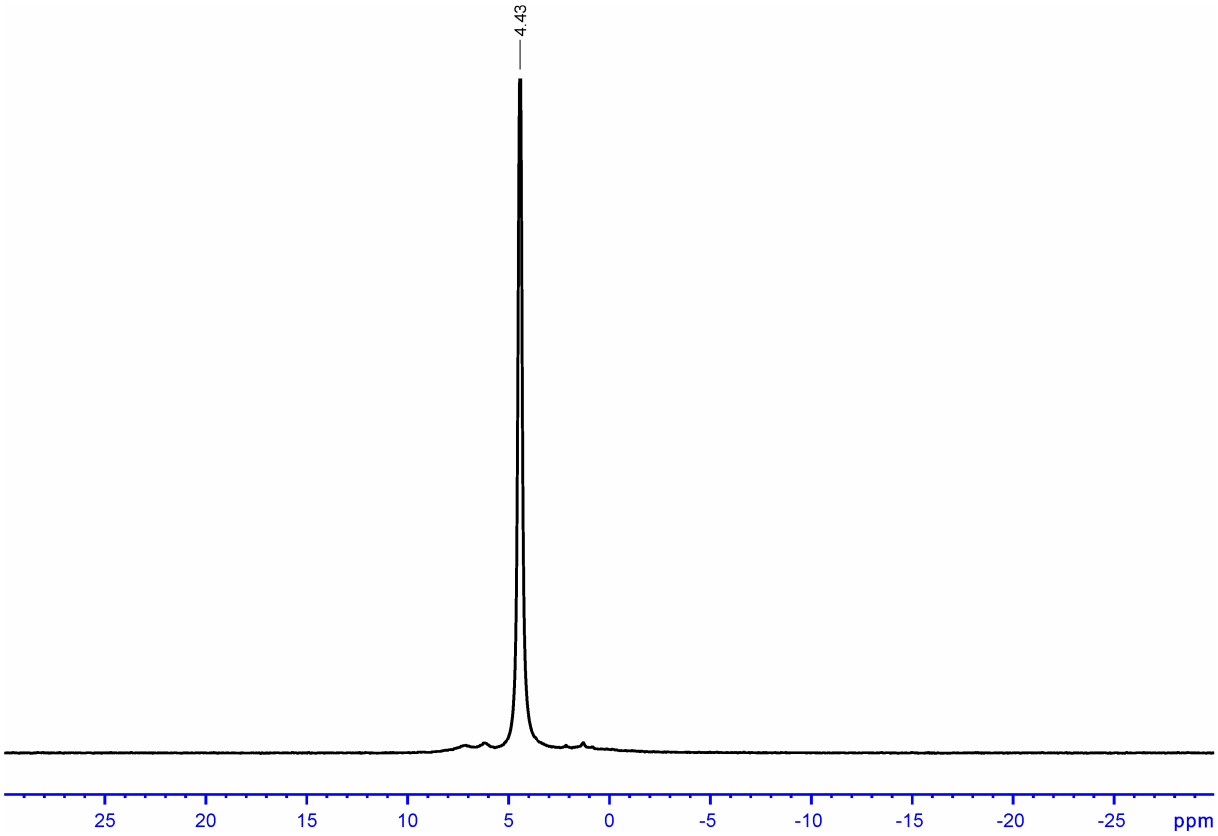

Figure S5. Solid-state ^{1}H-NMR (600.15 MHz) spectrum of intercalate $\mathbf{Y_{KCl}}$ recorded with the spin-echo technique at 55.555 kHz spinning speed.