Thermal decomposition of yttrium(III) hexanoate in argon - DTU Orbit (11/01/2019)

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The thermal decomposition of yttrium(III) hexanoate (Y(C5H11CO2)3·xH2O) in argon was studied by means of thermogravimetry, differential thermal analysis, IR-spectroscopy, X-ray diffraction at a laboratory Cu-tube source and in-situ experiments at a synchrotron radiation source as well as hot-stage optical microscopy. Dehydration occurs between 40°C and 110°C and is accompanied by a transition from solid to liquid crystalline state. At the onset of the main decomposition stage of the anhydrous Y(C5H11CO2)3, solidification takes place in the 315-335°C range. Y(C5H11CO2)3 decomposes in a single step into Y2O2CO3 with release of CO2 and 6-undecanone between 280°C and 490°C. A side reaction appears to yield elemental carbon and volatile decane (C10H22). Y2O2CO3 is converted to Y2O3 with release of CO2 between 500°C and 975°C.

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