Thermal decomposition of barium valerate in argon - DTU Orbit (08/11/2017)

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The thermal decomposition of barium valerate \((\text{Ba(C}_4\text{H}_9\text{CO}_2)_2/\text{Ba-pentanoate})\) was studied in argon by means of thermogravimetry, differential thermal analysis, IR-spectroscopy, X-ray diffraction and hot-stage optical microscopy. Melting takes place in two different steps, at 200 degrees C and 280 degrees C and evidence was found for the solidification of the melt at 380-440 degrees C, i.e. simultaneously with the onset of decomposition. Between 400 degrees C and 520 degrees C \((\text{Ba(C}_4\text{H}_9\text{CO}_2)_2)\) decomposes in two main steps, first into BaCO\text{O} with release of C\text{4H}_9\text{COC}_4\text{H}_9 (5-nonanone), whereas final conversion to BaO takes place with release of CO\text{2}. Elemental carbon that is left as a by-product is finally slowly burned by the residual oxygen present in the Ar atmosphere. (C) 2015 Elsevier B.V. All rights reserved.