Development of chemical blowing agents for foamable 3D printing inks

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The aim of the presented work is the development of a chemical blowing agent (BA), which is suitable for the application in an acrylate-based 3D printer ink. Initial evaluations of commercial blowing agents were unsatisfactory concerning the stability in the ink matrix. In order to solve this problem, various attempts are made to prevent the premature decomposition of the blowing agent. Unfortunately, it was not possible to find a suitable commercial blowing agent.

Therefore, new functionalized sulfonyl hydrazide-based blowing agents are developed. The developed blowing agents retain the foaming performance and show significant improvements in chemical stability in various thermal analyses compared to the commercial sulfonyl hydrazide-based blowing agents. Initial printing trials of the ink blends with the newly developed blowing agents show good printability since thin layers can be printed, subsequently foamed and cured [1].

[1] Wagner A., Kreuzer A., Göpper L., Schranzhofer L., Paulik C., Foamable acrylic based ink for the production of light weight parts by inkjet-based 3D printing, *European Polymer Journal*, (**2019**), 115, 325-334.