1. INTRODUCTION

In the pharmaceutical industry, it is important to know as much as possible about the structure and distribution of the active components within surface coatings of medical devices or a variety of other forms. An often employed technique for this investigation is fluorescence microscopy, which requires that the sample be treated with specific dyes before the image can be acquired. Whenever such a staining, which often leads to the sample being rendered useless for further studies, is not appropriate, Confocal Raman Microscopy provides the ability to non-invasively map chemical properties of such samples at the highest resolution and to acquire depth profiles.

2. INSTRUMENT AND EXPERIMENT

The Confocal Raman Microscope WITec alpha300 combines a highly sensitive confocal microscope and a high-transmission Raman spectroscopy system. In the Spectral Imaging Mode, a complete spectrum can be acquired in 50-100 ms with a resolution down to 200 nm. An image can be generated just by integrating over a specific Raman line or analyzing a variety of properties such as peak-width, center of mass, or a peak position. For depth profiling measurements, the focal plane can be moved in the z-direction when performing either x-z scan or generating x-y image stacks.

3. RESULTS

A surface of 200x200 µm of a tablet containing acetylsalicylic acid (ASA) was examined. In order to produce images with chemical sensitivity, 14400 full Raman spectra were acquired (in an array of 120x120 pixels) with an integration time of 50 ms each.

The red areas in figure 1 show the distribution of pure ASA, whereas the blue and green regions are the filler components. Depth profile measurements and application in different samples will be also presented.

4. CONCLUSION

With its imaging capabilities, Confocal Raman Microscopy enables the visualization of drug distribution in a variety of substrates.