PRESS RELEASE

29 APRIL 2019; SAARBRÜCKEN

INM expertise clarifies cause of slight blue discoloration of drinking water in the Heidelberg area

Physical Analytics at the INM was able to use special measuring methods to explain why drinking water in the community of Dossenheim (Rhein-Neckar Kreis) just outside Heidelberg recently had a slight blue color: the reason was the smallest, completely harmless lime particles. They are not visible to the naked eye and cannot be detected using chemical analysis methods. Such nanoparticles of lime are a natural component of many drinking water sources. A slight blue discoloration only becomes visible at higher concentrations of these lime particles.

The health department of the Rhein-Neckar-Kreis, which is also responsible for the city of Heidelberg, was able to confirm the health safety of the drinking water with chemical analysis methods on the same day of the incident. But the cause of the slightly bluish color of the drinking water was not found with these methods. Therefore, the health department turned to the Saarbrücken Leibniz Institute and asked for an intensive, physical analysis of various water samples.

"First, we examined the samples with a special electron microscope. For what is known as cryotransmission electron microscopy, we shock-frozen thin films of the water samples. The original structure of possible constituents in the water is retained," explains Marcus Koch, Head of Physical Analytics at the INM. Even the smallest structures can be represented with this measuring method. It provides evidence of nanometer-sized, undissolved carbonate compounds.

In addition, the water samples were examined using what is known as dynamic light scattering: Just as small molecules in the air scatter the light and make the sky appear blue or reddish, the nanometer-sized carbonate particles in the water also scatter the light. "Although the water appears clear to the naked eye, the light scattering is physically measurable at the carbonate nanoparticles," explains Isabella Tavernaro, an expert in light scattering methods at the INM. This measurement method provides information about the size and size distribution of the particles. "This enabled us to confirm that the carbonate particles are actually nanometer-sized structural units. This light scattering also explains the slight blue coloration of the water," says Tavernaro, summarizing the measurement results.

"We are pleased that the high level of expertise of our scientists and the versatile methodology of INM have contributed to solving the mystery of the

CONTACT

INM – Leibniz Institute
for New Materials
Campus D2 2
66123 Saarbrücken/Germany
www.leibniz-inm.de

Dr. Carola Jung
Press and Public Relations
carola.jung@leibniz-inm.de
Phone: +49681-9300-506
Fax: +49681-9300-223

slight blue coloring of water in the Heidelberg region," says Eduard Arzt, Scientific Director of the INM. The support of the health department in the Rhein-Neckar-Kreis is further proof of the INM's valued analytical expertise, which extends far beyond the campus in Saarbrücken.

Your expert at INM:
Dr. Marcus Koch
Head *Physical Analytics*
Phone: +49681-9300-144
marcus.koch@leibniz-inm.de

INM – Leibniz Institute for New Materials, situated in Saarbrücken, is an internationally leading centre for materials research. INM conducts research and development to create new materials – for today, tomorrow and beyond. Research at INM is performed in three fields: *Nanocomposite Technology*, *Interface Materials*, and *Bio Interfaces*. INM is an institute of the Leibniz Association and has about 260 employees.