

Scientists use silver to make lights shine brightly

June 6 2016

The toxic and expensive phosphors used widely in fluorescent lighting could be eliminated thanks to a new study conducted by a materials scientist at Queen Mary University of London (QMUL).

Writing in the journal *Nature Materials*, the international group of scientists modified a mineral called zeolite, more commonly found in washing powder, to incorporate tiny clusters of [silver](#) atoms.

At this very small scale (less than 10 atoms), the silver clusters act very differently and can even emit light.

Lead author Dr Oliver Fenwick from QMUL's School of Engineering and Materials Science, said: "We've shown that silver atoms can be assembled in the porous framework of minerals known as zeolites with a level of control not reported previously. This has allowed us to tailor very precisely the properties of the silver clusters to meet our needs—in this case an efficient phosphor.

"The high efficiency of the [materials](#) along with cheap, scalable synthesis makes them very attractive as next generation emitters for fluorescent lamps, LEDs and for biological imaging, for example for highlighting tumours or cell division."

Zeolites are porous minerals that can be found naturally or produced synthetically on an industrial scale. They are rigid and have a well-defined framework made of molecular-scale channels and cavities.

The researchers from Université de Strasbourg in France, where Dr Fenwick was based when carrying out the study, and KU Leuven in Belgium manipulated the characteristics of the zeolite pores to fine-tune the properties of the clusters of silver. By tailoring of the zeolite host, they demonstrated luminescence efficiencies close to 100 per cent.

More information: Tuning the energetics and tailoring the optical properties of silver clusters confined in zeolites, *Nature Materials*, [DOI: 10.1038/nmat4652](https://doi.org/10.1038/nmat4652)

Provided by Queen Mary, University of London

Citation: Scientists use silver to make lights shine brightly (2016, June 6) retrieved 24 May 2024 from <https://phys.org/news/2016-06-scientists-silver-brightly.html>

<p>This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.</p>
--