

News

ADVERTISEMENT

Imaging Tech Comes Out of the Mist

Thu, 05/07/2015 - 7:00am

by Univ. of Illinois

Get daily news for laboratory professionals - Sign up now!

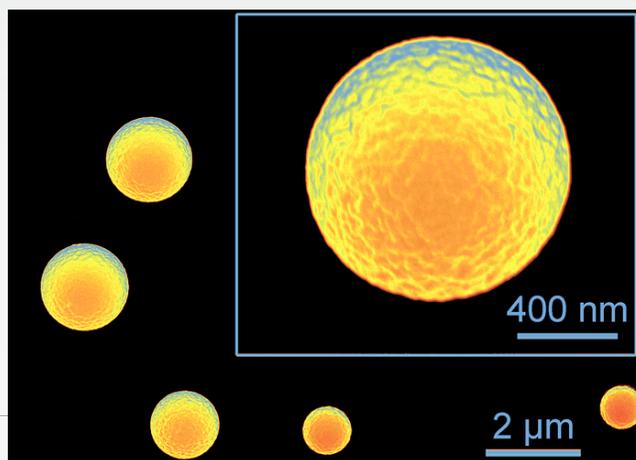
Technology in common household humidifiers could enable the next wave of high-tech medical imaging and targeted medicine, thanks to a new method for making tiny silicone microspheres developed by chemists at the [University of Illinois](#).

Led by chemistry professor Kenneth Suslick, the researchers published their results in the journal *Advanced Science*.

Microspheres, tiny spheres as small as a red blood cell, have shown promise as agents for targeted drug delivery to tissues, as contrast agents for medical imaging and in industrial applications. One prime contender as a material for microspheres is silicone, the rubbery plastic found in everything from bathtub caulk to kitchenware to medical implants, but a method of making silicone into microspheres has eluded scientists.

Silicone owes its versatility to its unique combination of properties: It is biocompatible, heat resistant, chemically stable, waterproof and environmentally benign. Yet some of those same qualities have frustrated researchers attempting to make silicone microspheres. The traditional microsphere-making method of suspending tiny droplets of material in another liquid does not work with silicone.

“For silicone, creating a stable emulsion of small droplets is very difficult,” Suslick said. “Even if a stable emulsion is achieved, you run into even bigger problems when it is heated, which is necessary to polymerize into solid spheres. Upon heating, small droplets of silicone starting material will coalesce with other droplets and produce only bigger spheres.”



Illinois chemists developed a method to make tiny silicone microspheres using misting technology found in household humidifiers. The spheres could have applications in targeted medicine and imaging. Image: Kenneth Suslick

The Illinois team uses a technique called ultrasonic spray pyrolysis, which employs technology found in household humidifiers to create a mist of ultrafine droplets. Suslick's group has pioneered the technique for a variety of materials, and teamed up with U. of I. chemistry professor Catherine Murphy to tackle the problem of silicone. The researchers send a mist containing all the ingredients of silicone through a heated tube, which solidifies the mist into tiny spheres of silicone. Because the droplets are all separate within the mist, they don't stick together like they do in an emulsion, so the resulting microspheres are roughly 100 times smaller than any previously reported.

The researchers made silicone microspheres with a variety of properties for different applications, including colored, fluorescent and magnetic spheres. Because the spheres are bio-inert – they do not react with chemicals in the body – and the researchers believe they would be excellent vessels for extended-release pharmaceuticals. They are also exploring potential applications of solid, hollow and magnetic microspheres.

“The applications for silicone microspheres, to date, have been almost entirely speculative, simply because no one has been able to actually make them,” said Jacqueline Rankin, the lead graduate student on this project. “With this new method, silicone microspheres can be easily and readily synthesized, facilitating the exploration of technologies that have only been speculated upon and creating novel technologies and new science in a number of scientific disciplines.”

TOPICS [PHYSICS/ENGINEERING](#) [TECHNOLOGY](#)

SHARE THIS STORY

   Like 0  Tweet 4  Share 1  Pinit  Share

COMMENTS

0 Comments

Laboratory Equipment

Login ▾

Recommend

Share

Sort by Best ▾



Start the discussion...

Be the first to comment.

ALSO ON LABORATORY EQUIPMENT

WHAT'S THIS?

Climate Change Denial Arguments 'Seep' into Scientific Debate

40 comments • 8 hours ago

Ava **Larry Miller** — After living through several iterations of this climate argument, the old saying always turns out to be true. Follow ...

Modularity in Microgravity

1 comment • 3 days ago

Ava **Lonewolf Ethos** — The most important design NASA planners failed to forecast was a launch vehicle to get their ...

Want to Go Green? GM Cuts Cost of Hybrid

3 comments • 3 days ago

Ava **ah.1960** — What I was referring to was the hype around cars like the Volt and how tremendously well they were selling. The ...

X-ray Study Aids Chocolate

1 comment • a day ago

Ava **Majorana Fermion** — It's amazing how industry experts will acknowledge that the product is changing over time, yet not ...

Subscribe

Add Disqus to your site

Privacy

DISQUS

Search LabEquipment



Exclusives

Products



Q&A: Daniel Grumiller and the Holographic Universe

May 7, 2015 7:00 am | by Lily Barback, Associate Editor

Smartphone Microscopes Aid Science, from Classroom to Central Africa

May 6, 2015 2:50 pm | by Seth Augenstein, Digital Reporter



Secret of Human Aging Unlocked by Rare Syndrome Research

May 6, 2015 2:09 pm | by Seth Augenstein, Digital Reporter



Fish's Tumor Indicates Pennsylvania River is 'Sick'

May 6, 2015 8:08 am | by Seth Augenstein, Digital Reporter

[View More Exclusive Content »](#)

[Current Issue](#)

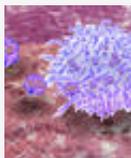
[LabOutlook](#)

[Supplements](#)



A Tale of Two Worlds

May 6, 2015 7:00 am | by Michelle Taylor, Editor-in-Chief



Different Lab-based Approaches Drive HIV Research

May 5, 2015 3:00 pm | by Jessica Burdg, Contributing Science Writer



Modularity in Microgravity: How the ISS is State-of-the-art 15 years Later

May 4, 2015 7:00 am | by Michelle Taylor, Editor-in-Chief



Laboratory Equipment: April 2015

April 21, 2015 10:37 am | by Laboratory Equipment

[Video of the Day](#)

Trending

- [Climate Change Denial Arguments 'Seep' into Scientific Debate](#)
42 comments · 31 minutes ago
- [Q&A: Daniel Grumiller and the Holographic Universe](#)
2 comments · 5 hours ago
- [Polygamy is Bad for Heart Health](#)
1 comment · 4 hours ago
- [Neuroscientist Stops Primate Experiments After Protests](#)
4 comments · 1 day ago
- [X-ray Study Aids Chocolate](#)
1 comment · 18 hours ago

[About Us](#)

[Articles](#)

[Consumables and
Supplies](#)

[Facebook](#)

[Advertising Info](#)

[Blogs](#)

[Developments in](#)

[Twitter](#)

[Contact Us](#)

[Digital Editions](#)

[YouTube](#)

Subscriptions

Events Calendar

OEM

 Tumblr

Privacy Policy

News

Environmental and

LinkedIn

Product Release

Sitemap

Field Testing

 RSS

Submission Form

Videos

Food and Beverage Labs

Supplier Directory

White Papers

Forensic Science

FAQ

Terms &

Fuel Technologies

Conditions

Instrumentation and Equipment

Lab Safety

Laboratory Design and Furnishings

Life Science

Pharmaceutical Labs

Separations and Spectroscopy

Software

All fields are required.

Lab News Daily

Headlines, products, and technologies for lab professionals.

Laboratory Equipment Video & Product Showcase

New products, literature, catalogs, and white papers for lab professionals.

CT Express

News, videos, application notes, and whitepapers focusing on Chromatography and Separation Science

SUBSCRIBE

Bioscience
TECHNOLOGY.

Chromatography
Techniques

DRUG
DISCOVERY & DEVELOPMENT.

Pharmaceutical
Processing

R&D

Scientific
Computing

Advantage Business Media © Copyright 2015 Advantage Business Media

ADVERTISEMENT