



The Latest Developments in Life Sciences & Medicine

May 7, 2015

Search

895 people on this site
powered by chartbeat

Other search tools: [Drugs](#) | [Health](#) | [News](#)

[Submit News](#) [Contact Us](#) [Newsletters](#)

Illinois chemists develop new technique for making tiny silicone microspheres

Published on May 7, 2015 at 2:50 AM · No Comments

Print PDF Recommend 0 Share 1 Share g+1 Tweet 7

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."

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."

Source:
University of Illinois at Urbana-Champaign

★★★★★ Be the first to rate this post

Posted in: [Device / Technology News](#) | [Medical Science News](#) | [Medical Research News](#)

Tags: [benign](#), [Blood](#), [Cell](#), [Drug Delivery](#), [Implants](#), [Medical Imaging](#)

[Permalink](#) | [Comments \(0\)](#)

Trending Stories



[Study shows link between upright locomotion and spinal health](#)



[Atrial fibrillation linked to only one type of heart attack](#)



[Incidence of esophageal cancer linked to GERD rises six-fold in recent decades](#)



[aTyr's Resolaris granted FDA Orphan Drug Designation for treatment of FSHD](#)



[Cardiff scientists make breakthrough asthma discovery](#)

Latest News



[Smartphone checks blood for parasitic disease](#)



[Disease-specific employee-based health plan helps reduce costs of care](#)



[Elsevier launches new NFS Journal](#)



[Kaiser Permanente, Intermountain Healthcare to participate in Disclosure Program](#)



[WHO, IHME partner to improve quality and use of global health information](#)



[Egalet announces business highlights, financial results for first quarter 2015](#)

News Medical
 Like

188,121 people like News Medical.



Facebook social plugin



Follow

+1

+ 3,498

UT Southwestern's new operating suite integrates surgical and endovascular techniques in one space

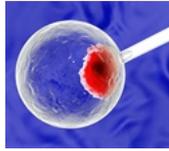
Psychologists plan to enhance online health information on lung cancer

Read in | English | Español | Français | Deutsch | Português | Italiano | 日本語 | 한국어 | 简体中文 | 繁體中文 | Nederlands | Русский | Svenska | Polski

Suggested Reading



Researchers invent injectable foam system to stop profuse bleeding from wound



New mouse model supports transplantation of human blood stem cells ... for irradiation



Blood gas testing: an interview with David Stein, PhD, CEO, Point of Care, Siemens... Diagnostics



Scientists reveal secrets of cell membrane proteins



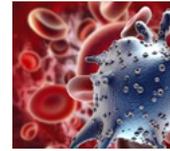
Molecular diagnostics and blood screening systems: an interview... Koppelman



New genetic programs for taking blank-slate stem cells and turning them into hu... blood



Blood gas POCT seminar video published online by sphere medical - n... medical's website



Tamoxifen gel stops breast cancer growth without causing dangerous side effects

Comments

The opinions expressed here are the views of the writer and do not necessarily reflect the views and opinions of News-Medical.Net.



Post a new comment

Login ...

Quirky Comment Title (optional)

Large text area for writing a comment

Post

News-Medical.Net provides this medical information service in accordance with these [terms and conditions](#). Please note that medical information found on this website is designed to support, not to replace the relationship between patient and physician/doctor and the medical advice they may provide.

[News A to Z](#) | [Drugs A to Z](#) | [Health A to Z](#) | [Clinical & Diagnostics](#) | [Life Science & Laboratory](#)
[Consumer Products](#) | [News Archive](#) | [Medical News Tweets](#) | [Information](#) | [Subscribe](#)



News-Medical.net - An AZoNetwork Site
Owned and Operated by AZoM.com Limited Copyright 2000-2015



This site complies with the HONcode standard for trustworthy health information: [verify here.](#)