

Three Interesting Uses for Mass Spectrometry

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(PhysOrg.com) -- When many think about mass spectrometry, they visualize uses in biomolecular work. This is because mass spectrometry used in MALDI and ESI techniques is much less harsh than ionization methods used before. These harsher methods often shatter the very proteins they are trying to measure. Mass spectrometry, though, doesn't shatter the proteins, and provides useful insights into the life sciences. However, that's not all mass spectrometry can be used for.

Here are three interesting (and somewhat surprising) uses for [mass spectrometry](#):

- **Measuring nanoparticle size:** Usually, nanoparticles are measured with the use of [transmission electron microscopy](#) or x-ray diffraction. But what if you don't have these fancy pieces of equipment? Interestingly, it appears that you can use a MALDI-TOF spectrometer to measure the size of nanoparticles. And, of course, once you have measured the size of a sphere, you can also calculate its density. The Scientist reports on research done by Anderson Marsh at Lebanon Valley College:

Surprisingly, when he ran that calculation, Marsh found that nanoparticulate platinum is about 20% denser than its bulk counterpart. "I don't know if that's significant," Marsh says, "but it could help explain some properties of metal [nanoparticles](#), such as melting behavior and [thermal expansion](#)."

- **Looking for toxins in toothpaste:** In some Chinese toothpastes, a toxic compound known as DEG is sometimes used as a sweetener. The compound is banned, but it is difficult to truly enforce the ban, since toothpaste is very difficult to test. It can be done, but it takes a lot of time. Until now. A Chinese scientist, Huanwen Chen, has come up with a way of using mass spectrometry to quickly screen for toxins. Additionally, this mass spectrometry method should also be transferable to testing other viscous liquids found in pharmaceuticals, biotechnology, other foods and chemicals.
- **Looking for pesticides:** [Nutritional supplements](#) are often touted as "natural" ways to boost health. However, the fact of the matter is that pesticides can find themselves in supplements and food. Unfortunately, testing for multiple pesticides is difficult. And is practically impossible without mass spectrometry. Douglas Hayward and Jon Wong at the U.S. FDA have developed a mass spectrometry method that can identify multiple compounds at once, hoping to reduce the amount of pesticides that enter the food supply.

It will be interesting to see what applications are coming next.

More information: The Scientist, "Can Mass Spec Really Do That?": www.the-scientist.com/article/display/57115/

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