How Ironic?: Developing a Ferrofluid

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Imagine a magnet and the items that are attracted to it. It is likely that what you imagined was something solid, maybe a magnet on a refrigerator or picking up cars in a junkyard. In this experiment, you will discover more about a ferrofluid, which takes the preconceived image of what should react to a magnet and expand it. A ferrofluid is a liquid paramagnetic substance that produces magnetic suspension when brought near a strong magnetic field. Ferrofluids were originally developed for NASA, primarily for liquid fuels in space. If you are interested in purchasing a small bottle, its costs are very excessive, commonly reaching around $300 for a Liter. This experiment demonstrates the development of a ferrofluid using less costly supplies, such as Ammonia, Oleic acid, and Kerosene, around the lab, that are effective. In short, if Ferric Chloride is reduced to Ferrous Chloride and placed within a suspension fluid, then a substantial, usable, accessible, and more cost effective ferrofluid should be produced. Using this procedure, I completed a trial of my ferrofluid a year ago. The result was not satisfactory, as it did not behave as commercial ferrofluids in regards to spiking. For this year's research, I decided to tweak the amounts of ammonia used within my experiment to perfect the results. I achieved the product I envisioned, as it spikes within magnetic fields and properly follows the magnet. This experiment could provide an abundance of opportunities. Better accessibility could provide a wider spectrum of research. Though the ferrofluid wasn’t used for its original directive, there is the possibility of it becoming widely used within the medical field concerning injected medicine. My research has the potential to escalate into something revolutionary.

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