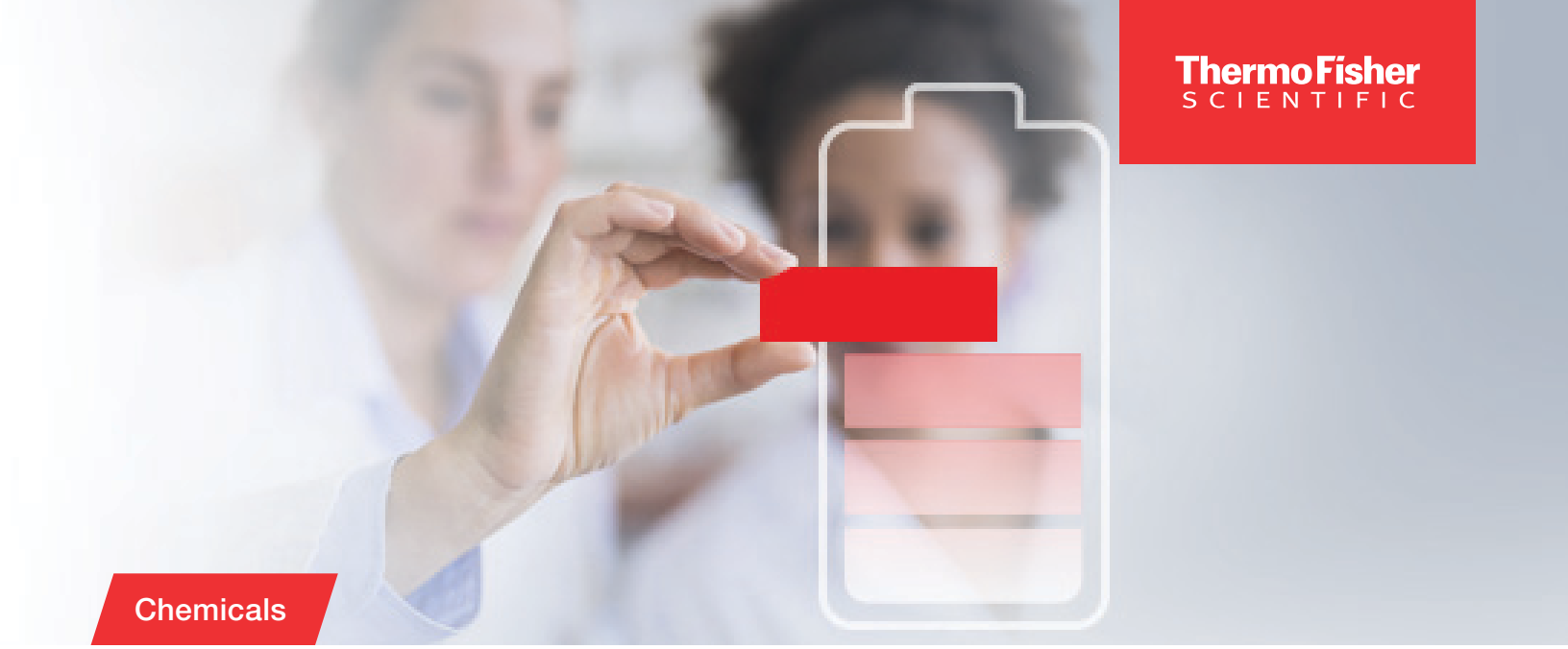

Chemicals

A journey in sustainable technology solutions

Zlatka Stoeva has parlayed a passion for organic chemistry into sustainable approaches and solutions

Pam Poulin, Market Development Manager

From curiosity to a career in material science and sustainable technologies

In a recent interview, we had the pleasure of speaking with an inspiring entrepreneur who has turned her passion for chemistry into a thriving, innovative, and sustainable materials company. Growing up in Bulgaria, Dr. Zlatka Stoeva had limited resources to keep her mind occupied. With only the library and textbooks available to her, she said, “My greatest joy came from reading textbooks, which early on lead to my interest in science.” It was a trip to her family’s attic one summer where she found a box of old textbooks, including one for organic chemistry. “At this point, I had only done one year of chemistry,” she continued. “I found this really interesting, and within one week, I read the entire textbook.” That chance encounter sparked a lifelong fascination with the world of molecules and their potential to change our lives.

Zlatka Stoeva took her curiosity for chemistry from Bulgaria to Scotland, where she earned a PhD in chemistry working on **battery materials** when it was still “fantasy land” when people were talking of using lithium-ion batteries in cars. Reflecting on her work with more than 20 years of hindsight, she acknowledges, “What we were doing then was really great, groundbreaking research.”

After a number of years at Cambridge University - inspired by the concept that Cambridge ideas can change the world - she founded **DZP Technologies** in 2008. Her goal was to develop sustainable technology that changes lives through scientific discovery. When asked about her company’s new product development approach, Zlatka Stoeva first noted, “We want to first understand what the needs in the market and society are, rather than finding a solution that might not resolve a problem.” She added that they take a holistic approach in their development. When asked to expand on this, she further added, “We want to make sure that by solving one problem, we don’t create another.

> “...We want to make sure that by solving one problem, we don’t create another.”

An electronics use case for a sustainable future

Her company is at the forefront of creating eco-friendly alternatives in the tech world. From printable solar panels to biodegradable wearable electronics, their innovations aim to significantly reduce the environmental impact of our gadgets. One of their most promising projects involves using natural materials to create flexible, sustainable electronics that could potentially decompose like leaves on a forest floor.

The search for an example of their sustainable approach to development led us to something called plastic electronics. As Zlatka explains, “This is a very exciting area and a big topic because nowadays, everyone wants to use electronics everywhere. We are talking about wearable electronics in furniture, in clothes, everywhere.”

Within this trending area of sustainable development, she has observed that most are attempting to make flexible or stretchable electronic devices by trying to adopt materials, **chemicals**, or **metals** from traditional electronics. When asked why this approach often fails, she responded, “Because, you might have one material for one specific part of it, but you don’t have the whole thing, the whole system, to make it work.”

The better approach, according to the co-founder of DZP Technologies, is to develop or source a set of materials from which you can create the entire device or system. She went on to share that, “We are thinking how to design our materials in such a way that you can create electronics, which are useful for people and easy to use, but at the same time, it doesn’t create a new problem like, for example, electronic waste or pollution.” When asked about the nature of the materials they use for these applications, she quickly pointed out that they don’t have to be **synthetic polymers**.

On the topic of non-synthetic polymers, Zlatka lit up when talking about the fact that wearable electronics could use biological materials. She explained her excitement with, “Materials from nature are very interesting and they have many interesting properties which can be used, including to make electronics of novel form and shape.”

She continued to explain that electronics made of **biological materials** are different in that they can be so integrated that you don’t actually feel like you have electronics on you. When asked about the sustainability aspects of using biology-inspired materials, Dr. Stoeva said, “Something else we’re always looking into is how to make these electronics more sustainable in the sense that, we don’t just use it and throw it away, and recycle straight away.” She noted that before even thinking of reducing waste and recycling topic, they first ask and consider if there is a way to repair or reuse something. If repair or reuse is not an option, she did share that she believes biologically-inspired materials are more recyclable and that their waste streams are more easily managed, relative to electronics made of synthetic polymers and metals.

China’s dominant role in the entire battery supply chain, from processed raw materials to finished components and cells, is undeniably significant and currently difficult for other nations to match. Only Korea (9%) and Japan (3%) have significant cathode active material manufacturing capacity outside China today. However, different battery chemistries require different supply chains. This may allow us to find opportunities to reduce supply chain dependencies and find more sustainable ways to move forward with our ambitions in the energy storage and electric mobility sectors.

Digitized materials ahead

On being asked about other ways she’s using her battery materials background and overall expertise on electronic properties of materials, Dr. Stoeva responded by calling out another exciting project involving digitization of materials. She says these are where, “The material carries within it information about how it was made, and how it reacts with the environment.” She went on to say, “You can code information into a material and make use of this information, a bit like how the DNA molecule carries genetic information.” Our conversation didn’t get too in depth on this exciting technology, but she did say, “It’s very sustainable,” and that they’re hoping to be able to demonstrate something in a few years’ time.”

For a deeper dive into this discussion and Zlatka Stoeva’ s work, check out her interview on the **Bringing Chemistry to Life** podcast. There, we learn more about her battery background and get into much more detail on her approach to developing novel but **sustainable** technology.

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