

Minerva Lithium Nanomosaic Technology is a Greener Way to Extract Lithium Within 72 Hours in a 2-Step Process



Sheeba Dawood
CEO Co-Founder
Minerva Lithium

Interview conducted by:
Lynn Fosse, Senior Editor
CEOCFO Magazine

CEOCFO: Ms. Dawood, what is the concept behind Minerva Lithium?

Ms. Dawood: At Minerva Lithium, our focus is to develop sustainable energy technologies, that could provide solutions to the rapidly growing energy storage market. Right now, our focus is critical mineral extraction as the whole world is transitioning to clean energy. Everything is being electrified, and for that we require batteries. Lithium is

primary component in batteries. Therefore, we are trying to extract lithium, so that we can meet the needs of exploding battery market.

CEOCFO: Would you tell us a little bit about the standard way that lithium is extracted now? What are you working on to make it better?

Ms. Dawood: Lithium is present in three different deposits, like hard rock, brine, and clay. Our technology works with brine deposits, which are 66% of total global lithium resources that are present in natural form. You do not require any kind of energy intensive occurrences to happen, to have lithium in the brine. The current technique that is used to extract lithium from brine is solar evaporation, in which the water is pumped into large ponds about 20,000 acres and allowed to be evaporated for 36 months. That water does not just have lithium, it has other minerals, too. To remove all other minerals, they add different kinds of harsh chemicals into the water, and then they get to the lithium. By the time they get to the lithium, only 30% of lithium is recovered, so in the span of 3 years, what you get is low grade lithium. To be more precise, just to produce 1 metric ton of lithium, 500,000 gallons of water is dried up. Additionally, fresh water is used to recover lithium, and then 5,000 kilograms of carbon is emitted. This is not a sustainable way to do it, to address the climate change crisis that we are facing. I have my PhD in nanoscience, and while working on my PhD we developed Nano Mosaic absorbents. These materials are known for their high surface area and tunable pore size. When I say high surface area, one gram of this material has a surface area which is equal to the area of soccer pitch, so it can accommodate that many number of minerals into its course. Taking advantage of porosity and tunability towards lithium, we have developed direct lithium extraction process, which is two-step process, that can recover lithium in just 72 hours using 30,000 gallons of water.

CEOCFO: What gave you the idea to go with this concept? Have similar approaches been tried?

Ms. Dawood: What gave me this approach was that my background was in nanoscience, and I am a researcher. I have been in the field of research for 13 years. While I was doing my research on my PhD project, I realized how batteries are going to be important in the next decade. While I was doing research, that is when I realized that critical minerals are going to be the next big thing. During my research about the current method, I realized how environmentally hazardous and tedious the process flow was. As a scientist, I have a passion to bring my science to the world, because not many realize the value of research. That is because an engineer or doctor has a value because in their profession what they do

is seen on daily basis, but the value of scientists is not really seen. That is why I had passion to bring my research and show to the world how much potential it has, and its impact to the world.

Having these two things in my mind while I research current methods, I realized the world really needs a better technology, because water is so important to humans, and water is just being used up, land is just being used up, compared to the mineral that is extracted. Not worth at the expense of our environment. Addressing these challenges, we have developed our technology using Nanomosaic adsorbents. There are several other early direct lithium extraction technologies, not of course one, however, we have a lot of differentiators when our technology is compared to the current one.



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CEO CFO: *Has the industry been paying attention?*

Ms. Dawood: Recently in February, President Biden announced to bolster critical mineral supply chains. Just the other day, I think last week of Thursday, again President Biden announced to increase the critical mineral supply chain, because in the coming decade everything is going to be electrified. Currently all the lithium industries, are working towards the lithium extraction, because it is going to be the next big thing. That is how we have seen a huge movement in the critical mineral industry.

“Science is the answer to some of the skepticism. Basic science has been done, proved, and published. It is too good to be true. Well, its proven. Our Nanomosaic adsorbents is an exceptional material as it will help address the increasing need for battery grade lithium and strengthen the supply chain by offering a processing route for brine concentrates in USA.” Sheeba Dawood

CEO CFO: *Would you be licensing the technology, or would you be working with someone to implement?*

Ms. Dawood: The market strategy depends completely upon my customers. If they own the brine structure, I will partner with them. If they do not own the brine operations, but just own the brine, then I would license the technology. Therefore, it completely depends upon the customers that I am serving.

CEO CFO: *What are your next steps? What do you see for the next 6-to-12 months for Minerva Lithium?*

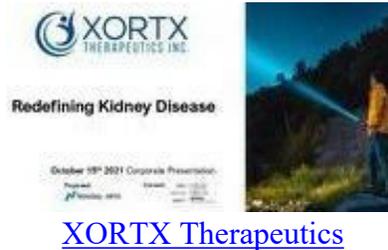
Ms. Dawood: For Minerva Lithium, right now we have raised up to \$600 K and mostly from federal and state grants. I would say that right now, we are heading towards the pilot stage where we are developing the modular unit, and we do have some traction from our clients with agreements for brine testing and onsite operations.

CEO CFO: *What surprised you, from concept to where you are today?*

Ms. Dawood: During the customer interviews on 2018, I really did not see much attention and interest in energy storage segment, like petrol/chemical companies, oil industries and lithium industries. While I used to talk about lithium, and I

used to say, “there is lithium in your water and you need to get that out, that is the game changer. I did not see any interest. However, right now, I see people value the importance of it, and everyone has really joined in to work towards it.

Also, the most important factor that surprised me, is how there is awareness among public to bring in clean tech technologies, as everyone is concerned about the global warming.



CEOCFO: Are you seeking partnerships, or funding today, or are you good to go for a while?

Ms. Dawood: We are doing fund raising right now, in about 6 to 8 months closing the around, by March 2023. Further, we are seeking strategic partnerships which would be valuable to the company.

CEOCFO: Your method is so much faster, easier and energy efficient. How do you get over some of the skepticism about something that seems almost too good to be true?

Ms. Dawood: This is something that I come across all the time. Science is the answer to some of skepticism. Basic science has been done, proved, and published. It is too good to be true. Well, its proven. We believe in our product, and we know that it is has potential, and the only way is to move forward is through customer validation and show those facts. That is what I believe in. Our Nanomosaic adsorbents are an exceptional material, as it will help address the increasing need for battery grade lithium and strengthen the supply chain by offering a processing route for brine concentrates in USA.