NANOTECH

SECTOR OVERVIEW **Leading U.S. researchers and technologists recently went before a congressional committee to testify that the nation is at risk of falling behind other countries in nanotechnology research. Floyd Kvamme, partner emeritus at VC firm Kleiner Perkins Caufield & Byers, told the committee that "other countries are aggressively chasing U.S. leadership." The problem, said those who testified, is that those other countries are spending more on a per-capita basis on nanotech research than the U.S. Another problem is declining private investment in the sector. VC funding dropped 48 percent from $385 million in 2002 to $200 million in 2004 according to Lux Research. Many went before the committee to argue that now is the time for the government to step up and increase its funding for nanotechnology. SiGNa Chemistry, featured here, is a prime example of a promising nanotech-related firm in search of private funding.**

SIGNA CHEMISTRY

Hydrogen Fuel Production
New York, New York
SiGNaChem.com

IP RATING (scale 1–10)	
INNOVATION	9
CAPITALIZATION	4
MARKET OPPTY	8

Researchers have long known that alkali metals held promise in many fields, from pharmaceuticals to portable power generation. Immersed in liquid, the metals produce a useful chemical reaction.

The problem has been that alkali metals are also quite volatile. They often burst into flame when exposed to air or moisture, a characteristic that has tended to eliminate them from contention in a lot of applications, especially portable power. (Spontaneous combustion: not so good for your laptop.)

Startup SiGNa Chemistry claims it's developed a way to tame alkali metals and harness their reactive power. The patent-pending method is called nanoencapsulation, a process by which alkali metal is combined with a porous silica gel to yield a stable powder. The powder can be easily and cheaply stored, transported and handled. It can be used at room temperature without a catalyst. Mixed with water, it produces cheap, clean hydrogen gas.

Applications for the SiGNa Chem powder are many. Early markets will be drug making and oil refining, where it should save money and time. The company also plans to pursue the $10 billion portable-power market. Michael Lefenfeld, president and chief scientific officer at SiGNa Chemistry, says lab tests show that .9 milligrams of the company's powder can produce 20 milliliters of hydrogen gas. He estimates the cost of the material at about $5 per gram.

Lefenfeld hit on his idea somewhat by accident. He was a Columbia Ph.D. student in chemistry, looking for a better way to spray aerosol fragrances, when he thought of using an alkali metal—in this case sodium—to separate the fragrance oils from the water in a spray. The problem, again, was reining in the sodium.

Searching for an answer on the internet, Lefenfeld came upon silica gel, original IP by James Dye of Michigan State University. Dye had been retired for nine years and was skeptical. But Lefenfeld won him over and Dye's knowledge was a driving force in the development of the technology.

SiGNa Chemistry is now looking to raise money for a lab in New Jersey and already has paying customers for its product. It has sold evaluation quantities to Phizer, Alphora, BASF and Shell Chemical, and recently signed a distribution deal with Sigma Aldrich, a global chemical-supply distributor.

ANALYSIS: SiGNa Chemistry is catching the attention of R&D managers from a number of industries. One chemical analyst says the real test is whether the company can translate its success in the lab to a large-scale production environment, where it's considerably more difficult to achieve results. One VC notes that the company also needs to prove that the cost to produce the hydrogen gas does not exceed the benefits. Still, SiGNa might just be on to something very, very big. —*Lee Bruno*

SOFTWARE

SECTOR OVERVIEW **E-commerce software investments are back in vogue. After shunning the category for several years, venture capitalists are returning. Why? It's cheaper than ever to launch an online business. Moreover, e-commerce transactions are expected to account for 7.7 percent of total U.S. consumer spending this year, which translates to $172.4 billion, according to the National Retail Federation. VCs, for their part, are investing in software companies that help e-tailers offer a consistent, high-quality experience, whether that means a better search engine or new personalization applications. Meaning Master, featured here, is a search technology that could rise to the top of an increasingly crowded field.**

MEANING MASTER TECHNOLOGIES

Contextual Search
Santa Monica, California
MeaningMaster.com

IP RATING (scale 1–10)	
INNOVATION	8
CAPITALIZATION	7
MARKET OPPTY	8

Does the world need another search engine? Meaning Master Technologies thinks so. Here's why. Enter "condo by the beach" at Craigslist and you get no results. Meaning Master's search technology will retrieve more than a dozen links, variously including the words "condominium," "shore," "townhouse" and "ocean."

Meaning Master says its ability to place search terms in context and retrieve results that include synonyms and acronyms is 90 percent accurate. This compares to an accuracy rate of about 33 percent with pattern-matching search engines like Google or the engine used by Craigslist.

Kathleen Dahlgren, founder of Meaning Master, thinks her search technology is a great leap forward. "Once our technology is recognized for what it is, people will flock to it because it simply works better than anything else."

Dahlgren has a Ph.D. in a computational linguistics from UCLA. She began working on the Meaning Master technology in the 1980s while she was at IBM. Over the years, she's worked