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Future of chemicals III: The commoditization of specialty chemicals

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the inevitable**



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Executive summary



As the specialty chemical sector fights to stave off the deleterious influence of commoditization — a losing struggle for many businesses — it is becoming increasingly clear that a large number of companies in the industry have failed to manage and nurture their business models well enough. Specialty chemical businesses are dependent on innovation and a continuous pipeline of “real” innovative products and applications. But research and development funds have dried up, and new molecular discoveries are increasingly rare. Few specialty chemical companies have demonstrated the ability or nimbleness to adjust to the new, much more difficult realities in the industry, and it is little surprise that the specialty chemical sector is rapidly shrinking and searching for a clear direction. How well these companies adopt one of three business models will determine success or failure for individual outfits and the industry as a whole.

The problem with specialty chemicals

There used to be something special about specialty chemicals, but in many ways this industry has lost its luster. Like so many once-hot sectors with once-enviable profits — telecommunications and PCs are good examples — the specialty chemical industry has been beset by commoditization. Just a decade ago, gross margins for specialty products including additives, pigments, personal care products made with process chemicals, and selected polymers were extremely attractive; thus, many companies — even many large ones — were motivated to participate in the specialty segment. For example, gross margins for polycarbonates were a remarkable 80 to 90 percent; now they are as low as 60 percent and falling; indeed, most customers today view polycarbonates as a commodity. And that’s illustrative of the specialty chemical sector as a whole, where gross margins have declined to a historical low of about 30 percent.

Key highlights

- Commoditization is an inevitable part of the life cycle of most products; specialty chemicals are not an exception.
 - The specialty chemical sector today is particularly vulnerable to commoditization, as innovation has dried up and competition has increased.
 - Too many specialty chemical companies have tried to fight commoditization with misdirected innovation and service levels that cannot be sustained profitably.
 - Looking ahead, to reach sustainable and profitable growth, specialty chemical companies must rethink their portfolios, challenge the conventional specialty mind-set, and redefine their business models to adapt to new realities.
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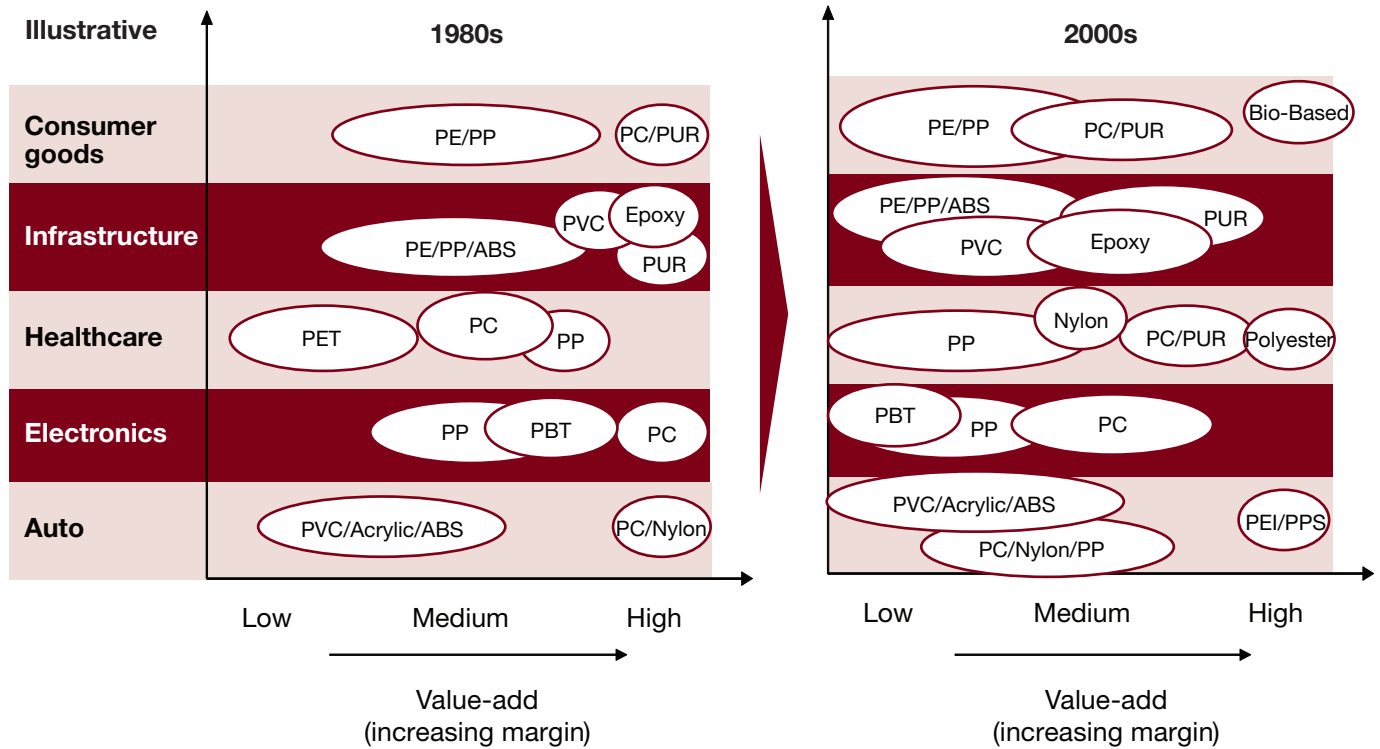
Except for a few niche segments, commoditization was and still is an inevitable result of the life cycle of specialty chemicals. At first, new and differentiating chemicals, polymers, or formulations are developed, driven by application know-how or technology advances and usually protected by patents. Initially, because of their unique and differentiating properties, which enable customers to achieve higher levels of product performance or to enter new applications, these molecules are perceived as having significant value for target segments of the customer base. As a result, chemical companies can charge a premium for these products. Indeed, they are so unique and fresh that while customers are aware of the potential of these new products, they require support in the use and fine-tuning of them. To address this, the most enterprising specialty chemical companies dedicate sales forces with expertise in applications and technical specifications to these new products, and they also typically bundle services — for example, training that is tailored to a customer’s specific needs — with the chemicals. All of this helps justify charging more for the specialized items. Call this the sweet spot for specialty chemical companies.

Over time, though, the memories of that sweet spot are about all that remain. Slowly, but inevitably, other manufacturers, which have gradually improved their know-how of the specialty chemical arena, begin to penetrate the market, often leveraging its attractive cost base and lucrative profit margins. With some trepidation about losing its first-mover advantage, the specialty chemical provider feels compelled to redirect its support toward lower-margin applications in hopes of expanding and creating new markets for its product — often overlooking the fact that these less profitable applications and additional R&D expenditures may not be warranted. (In several cases, a specialty chemical company has suddenly found itself in a race to the bottom.) A long and costly price war — or, in this context, commoditization — ensues.

An apt illustration of this product proliferation phenomenon can be seen by comparing the 1980s to today (*see Exhibit 1, next page*). Decades ago, engineering plastics like polycarbonates and nylon were primarily serving high-value-add applications with relatively small market sizes — for example, auto companies used them for components that had to withstand high temperatures. But a slew of companies have developed new applications for these polymers, widening their market significantly. However, as these markets were often already served by lower-priced incumbents, the new entrants had to accept substantially lower margins to compete. And the features that initially differentiated some of these engineering plastics from other types of chemicals are now commonplace.

Exhibit 1

Plastics proliferate and move from high margins to low over two decades



Note: Abbreviations are for acrylonitrile butadiene styrene (ABS), polybutylene terephthalate (PBT), polycarbonate (PC), polyethylene (PE), polyetherimide (PEI), polyethylene terephthalate (PET), polypropylene (PP), polyphenylene sulfide (PPS), polyurethane (PUR), and polyvinyl chloride (PVC).

Source: Industry interviews; Strategy& analysis

For specialty chemical companies, this unavoidable scenario doesn't seem like the end of the world, at least at first. Indeed, as long as they can replace commoditized products with new ones, their innovation-based business model can remain intact. Unfortunately, that is getting harder and harder to do: The innovation rate in the chemical sector in general is declining, and advances are increasingly focused on products with limited business potential or merely incremental innovation value (see Exhibit 2, page 9).

Even companies with market-focused, customer-centric philosophies increasingly struggle because most of the low-hanging fruit in

applications has already been picked, and customers' knowledge about the impact and relevance of new chemicals to their products has grown significantly, enough that they are pickier about purchasing untried chemicals and applications. In addition, with a greater focus than ever on cutting costs, customers assess the potential value delivered by their chemical suppliers much more rigorously than in the past. In short, several players are faced with an increasing fragmentation of their product portfolios and eroding margins just when the bargaining power of their customers and the number of competitors are increasing.

Out of this, a vicious circle has emerged. Many companies have responded by reducing the amount they spend on innovation — an effort to cut costs when margins are falling that has worsened the decline in developing new chemicals. R&D expenditures in the specialty segment have dropped by as much as 20 percent since 2002.

All of which has left many specialty chemical companies with no choice but to adjust their marketing strategies away from innovation and new applications toward a less profitable portfolio of commodities and specialty products that are rapidly diminishing in value. The result is too much money and effort targeted at selling commodities, which hurts profit margins, while new product development lags, leaving the portfolio woefully shy of critical high-margin specialty items. More than anything else, this reflects the difficulty of changing business models even as business conditions shift, because altering them to face new environments involves significant and often uncomfortable dislocations in organizational structure, processes, R&D focus, application technology development, and, of course, production and supply chain optimization.

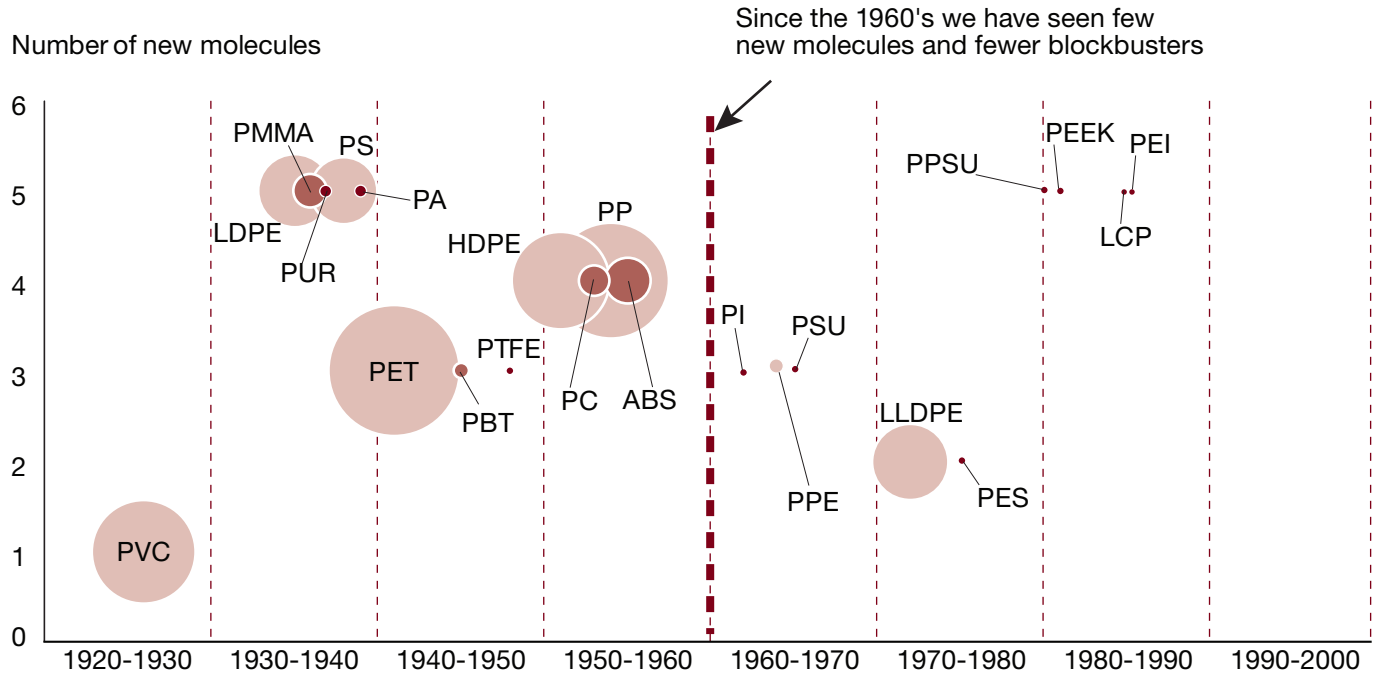
Often, market dislocations or shocks will catalyze such a dramatic change. In those cases, companies have no choice but to come up with new strategies and innovative business models; if they don't, they doom themselves to suboptimal performance. But the relentless economic growth of the 1990s and mid-2000s to a large degree cushioned the fall for many specialty chemical companies, whose profits didn't reflect the true weakness of their portfolios. So they didn't begin to feel the pain of commoditization until more recently, when the global economy slowed and global competition increased. Only now is it becoming readily apparent that many specialty chemical companies are weighed down by their business models and need to adjust, a rather painful exercise that few organizations will undertake successfully.

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Exhibit 2

The innovation pipeline dries up

Decline in number of new molecules and blockbusters



Size of bubble indicates relative volume, with PET showing a baseline of 60 KTon
Chemicals with a volume of > 0.1 KTon are indicated by a small dot (•)

Note: For PS, PTFE, and PVC, the date of commercialization is used (molecules discovered in 1800s). Abbreviations are for acrylonitrile butadiene styrene (ABS), high-density polyethylene (HDPE), liquid crystalline polymer (LCP), low-density polyethylene (LDPE), linear low-density polyethylene (LLDPE), polyamide (PA), polybutylene terephthalate (PBT), polycarbonate (PC), polyether ether ketone (PEEK), polyetherimide (PEI), polyether sulfide (PES), polyethylene terephthalate (PET), polyimide (PI), poly(methyl methacrylate) (PMMA), polypropylene (PP), polyphenylene ether (PPE), polyphenylene sulfone (PPSU), polystyrene (PS), polysulfone (PSU), polytetrafluoroethane (PTFE), polyurethane (PUR), and polyvinyl chloride (PVC).

Source: Chemsystems, 2007 data; Strategy& analysis

Which new business model?

Commoditization is inevitable and needs to be managed actively. Once a company is aware of the commoditization threat in its portfolio, applying appropriate business models can help sustain the profitability of respective business segments. Turning the flawed models around requires looking at the specialty chemical business with an entirely new lens, in the process analyzing a company's operations objectively and making tough decisions that ultimately transform laggard organizations into those more suited for today's operational conditions in the industry. Clearly, the specialty chemical sector will fundamentally change in the next decade. But just applying a commodities business model to specialty businesses is not a satisfactory answer in all cases, because it places significant value potential at risk. In our view, there are three ideal possible approaches that specialty chemical companies should consider:

1. Customized products: This is a good strategy when the specialty chemical has already become a pseudo-commodity and by itself cannot command a premium anymore. By custom tailoring the formulation for individual customers in particular industries, companies take advantage of their inside knowledge of end-users to maintain somewhat higher premiums even during commoditization. This is not inherently a competitive advantage; it merely buys time while new chemicals and products can be developed. From a business model perspective, this approach adds a lot of complexity to the supply chain, so it should be undertaken only when all the life-cycle costs are weighed against the potential returns. Examples of products customized in this fashion include paints and coatings made to the specifications of individual automakers or polycarbonates enhanced with thermoplastics like ABS for specific aerospace and defense companies. We believe that a majority of commoditizing specialties can be transformed into customized products.

2. Solutions and materials: This model is expected to be the new growth lever for today's specialty players. In this approach, companies use their deep knowledge of their customers, applications, and technology to find new materials and solutions for large groups of

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end-users. Companies that implement this strategy successfully can enjoy the types of sustainable and stable revenue returns that the so-called razor-blade model offers; that is, after the initial sale, customers are likely to keep coming back for refills over a long period of time. This approach is particularly valuable for established chemical companies because their long-standing relationships with customers — and their intimate understanding of customer products, processes, and operations — allow them to address end-user needs more precisely than newer outfits in the chemical industry. Pricing and promotions management is critical, however, to make this strategy work. Products must be offered at prices that customers perceive to be on par with the value of these new solutions and materials, and chemical companies have to decide whether to seek high margins but low volume (and possibly low cash flow) or high volume with lower margins.

Lonza's recent bioscience blitz and Monsanto's transformation from a fertilizer and pesticide giant into the world's largest proponent of genetically modified organism seeds are apt illustrations of a solutions and materials approach.

Overall, a move into either a customized products or a solutions and materials model will require a significant upgrade of a company's go-to-market capabilities as well as its complexity and innovation management skills. For example, transformed specialty chemical companies will have to successfully adopt new innovation-focused strategies encompassing five key dimensions of innovation management: prolific idea generation; cross-functional and -regional cooperation; multiple product growth platforms with realistic targets; a disciplined process that holds project managers responsible for execution; and ruthless portfolio management. While most companies are good at the first dimensions, very few actually attempt real portfolio management — to their detriment. In order to achieve a balanced innovation portfolio, killing bad projects early and making hard decisions about outcomes at clear hurdle points in the design process — as opposed to merely hoping that success will be achieved — are absolutely essential.

Companies that choose to focus on customized products or solutions and materials must also clearly identify the markets in which they can gain and sustain leadership positions. Currently, specialty chemical companies positioned in the top three of their segments sustain the most attractive margins. Going forward, transformed specialty players must have sufficient management vision to accurately anticipate which future segment will provide the most value for customers, and they must have the discipline to develop and deliver these offerings at the lowest cost and in the least wasteful ways. In addition, companies must have the foresight to recognize when a specialty chemical, application,

or product is headed toward commoditization (*see Exhibit 3, next page*). If it is, the company must make quick and careful decisions about separating the item from the specialty side of the business.

3. Basic chemicals: For most companies, both customized products and solutions and materials are viewed as strategies that carry too much risk and, hence, are avoided. Indeed, moving from a specialties business model to merely offering basic, commoditized chemicals is the typical approach and will continue to be a valid option for products that do not offer additional potential as customized products or solutions and materials. An upcoming Strategy& report in the Future of Chemicals series will offer a step-by-step guide to implementing a commodities-based chemical strategy.

Although commoditization appears to be an inevitable stage in the specialty chemical landscape today, some specialty niche markets still exist; examples are defense and aerospace. In our work with several niche players, we have observed that the most successful ones cultivate the ability to seamlessly link innovative problem-solving, marketing, and operating activities and to form tight relationships with horizontal and vertical layers of customers' organizations. This allows them to develop a lasting knowledge of customer behaviors, needs, and preferences, which is a far more powerful barrier to entry than, say, patent protection, which has a limited lifetime. In addition, these companies judiciously seek new growth opportunities that dovetail well with their culture and mind-set and never compromise the coherence of their strategy, built on their capabilities,¹ in pursuit of bigger markets where they don't belong.

In any case, companies will need to be prepared to establish several business models based on the different commoditization speeds of their portfolios and reflecting the variety of their "natural" businesses, which will be determined by differences in customers, regions, assets, operations, and projected revenues and expenses. These natural businesses must be maintained separately, segregated from one another so that each focuses solely on the part of the market that it is targeting. And as the external environment evolves, the natural businesses may change shape accordingly, requiring an updated business model.

Exhibit 3

Signs of commoditization

Internal signs (symptoms)	External signs
<p>Accelerating proliferation of SKUs</p> <p>Declining margin</p> <p>Widening gap in the profit split between “upstream core molecule” production and “downstream application”</p> <p>Compressing timeline in the margin erosion</p> <p>Decreasing sales force effectiveness with same structure and incentives</p>	<p>Increasing excess capacity in upstream segment (e.g. resin manufacturing)</p> <p>Demand slowdown in the target downstream markets</p> <p>Emerging technology breakthroughs creating cheap product substitutes in the downstream</p> <p>Emergence of low-cost players</p> <p>Emergence of new channels</p>

Source: Strategy&

Conclusion

Specialty chemical companies are facing a critical crossroads of their own making. Individual business segments will have to cope with managing the inevitable commoditization process. We have outlined in some detail the expected transformation of specialties. Companies that first succeed in analyzing and identifying the key components of their product lines and the natural businesses they possess will have the opportunity to shape the market. In many ways, the product portfolios of these companies can and should dictate their future and the type of business models they must implement. Without that alignment, the chances decline rapidly that specialty chemical companies will not fall prey to commoditization.

Endnote

¹ Leinwand, Paul and Cesare Mainardi, *Essential Advantage: How to Win with a Capabilities-Driven Strategy* (Harvard Business Review Press, December 2010).

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