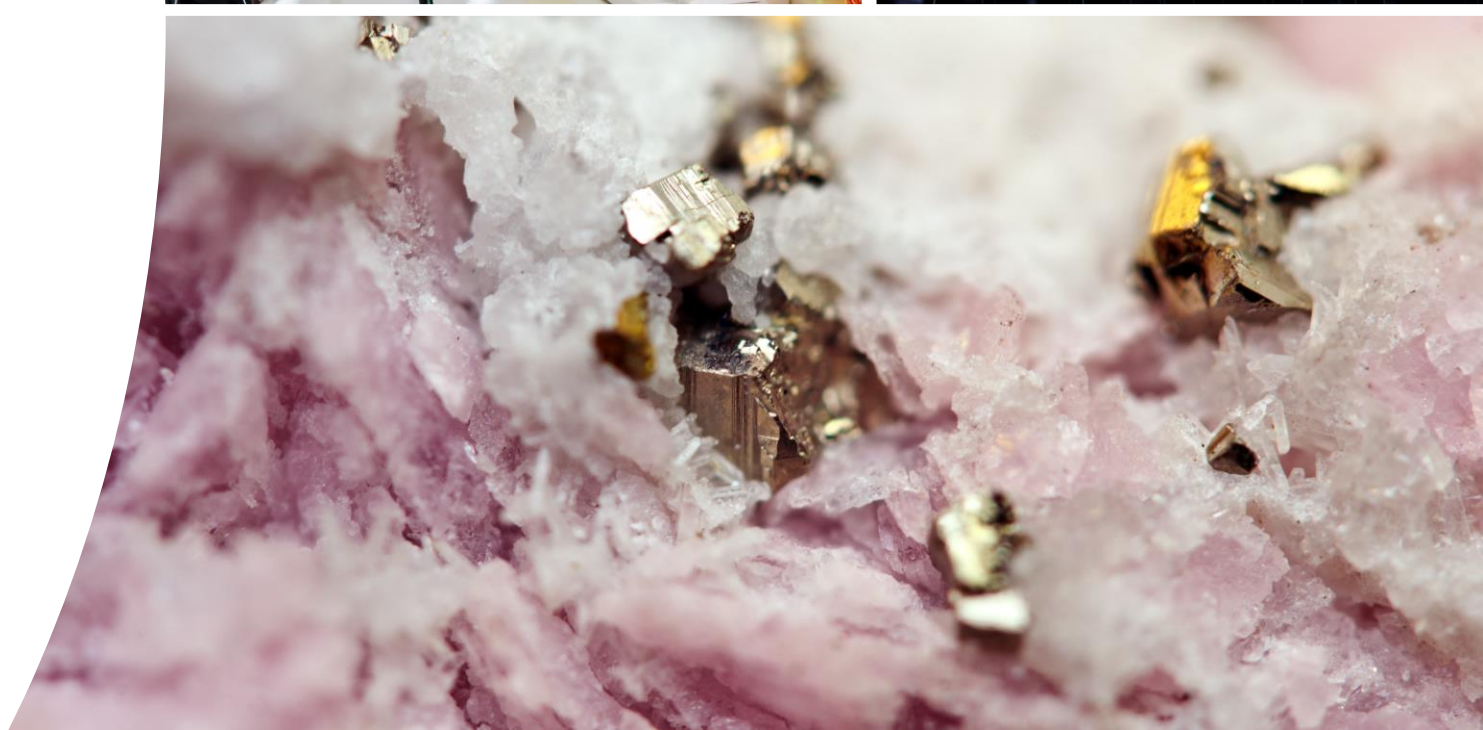




**BIS Research**  
Emerging Technology Market Intelligence

# Advanced Chemicals & Materials





# AGENDA

- **Advanced Chemicals & Materials Industry**

- Key Structural Elements
- Impact of COVID-19
- Emerging Technologies
- Patent Landscape
- Key Developments

- **BIS Research – Advanced Chemicals & Materials Portfolio and Experience**

- Bulk/Commodity Chemicals
- Specialty Performance Chemicals
- Advanced Materials
- Bio Based Materials
- Specialty Metals and Minerals

- **BIS Research – Advanced Chemicals & Materials Domain**

- Thought Leadership
- Key Customers
- Strategic Questions Answered
- Case Studies
- Testimonials
- Research Methodology



## Bulk/Commodity Chemicals

- Inorganic & Organic Chemicals
- Petrochemicals
- Industrial Gases
- Disinfectants

## Specialty Performance Chemicals

- Adhesives
- Agrochemicals
- Specialty Additives
- Paints & Coatings
- Lubricants
- Surfactants/ Emollients

## Chemicals & Materials

## Specialty Metals & Minerals

- Specialty Metals
- Minerals
- Rare Earth Elements

## Bio-Based Materials

- Green Chemicals
- Bio-Based Plastics
- Bio-Based Petrochemical Substitutes

## Advanced Materials

- Advanced Composites
- Advanced Ceramics
- Nano Engineered Materials
- Packaging Materials
- Foam & Membranes
- High-Performance Fabrics & Textiles

Source: ICIS and BIS Research Analysis

1

## Supply Chain Disruption

Government across various nations had enforced a lockdown to limit the spread of coronavirus. As a result, several restrictions were imposed on the movement of goods and individuals. Furthermore, several chemical companies had to put their operations on hold. This has disrupted the supply chain of raw material inputs and chemicals intermediates

2

## Digitization

Chemical companies are proactively adopting advanced digital capabilities that integrate their production operation with supply chain and logistics counterparts to ensure the on-time delivery of their product. Implementation of automation, data-science augmentation, and remote-controlled production reduces worker density and ensures an efficient operation with reduced efforts.

3

## The Decline in Petrochemical Demand

As a measure to contain the spread of coronavirus, the government across several nations had imposed a lockdown which resulted in the closure of the chemical manufacturing facilities. This led to a reduction in the demand for petrochemical products such as, ethylene, propylene, benzene, etc. which in turn adversely impacted the growth of the chemical industry.

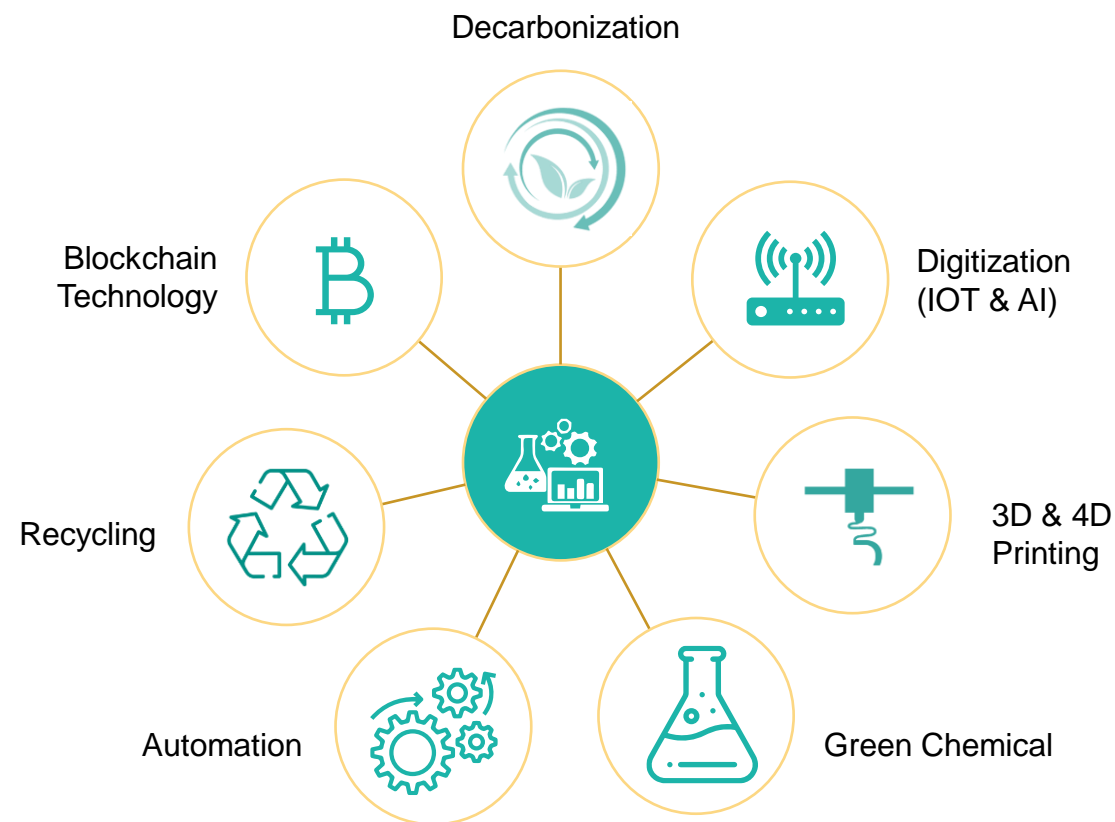
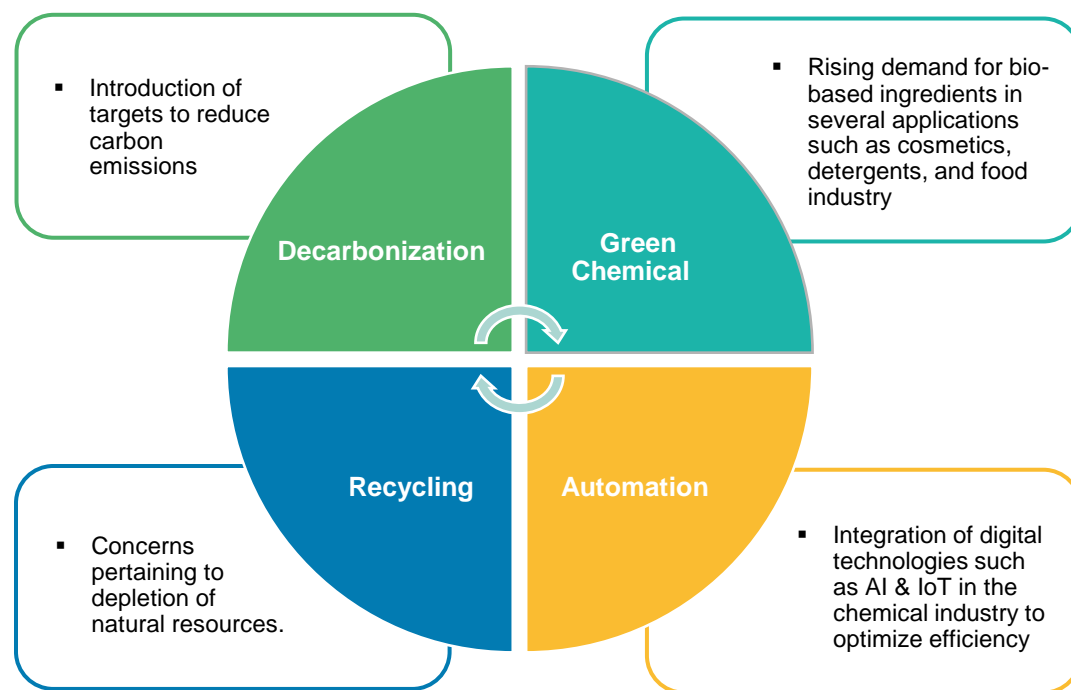
# Emerging Technologies/ Use Cases in Advanced Chemical & Materials Industry



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Global chemical and material industry is witnessing the industrial revolution, in which Internet-based communication technology is converging with sustainable technologies. Stringent regulations to minimize GHG emissions, rise in efforts to reduce fossil fuel dependency, the adherence to decarbonization targets, and benefits associated with the adoption of bio-based products, are some of the imperative parameters increasing the focus of researchers/scientists and companies to innovate within sustainable technologies and materials to combat climate change.

## Key Trends



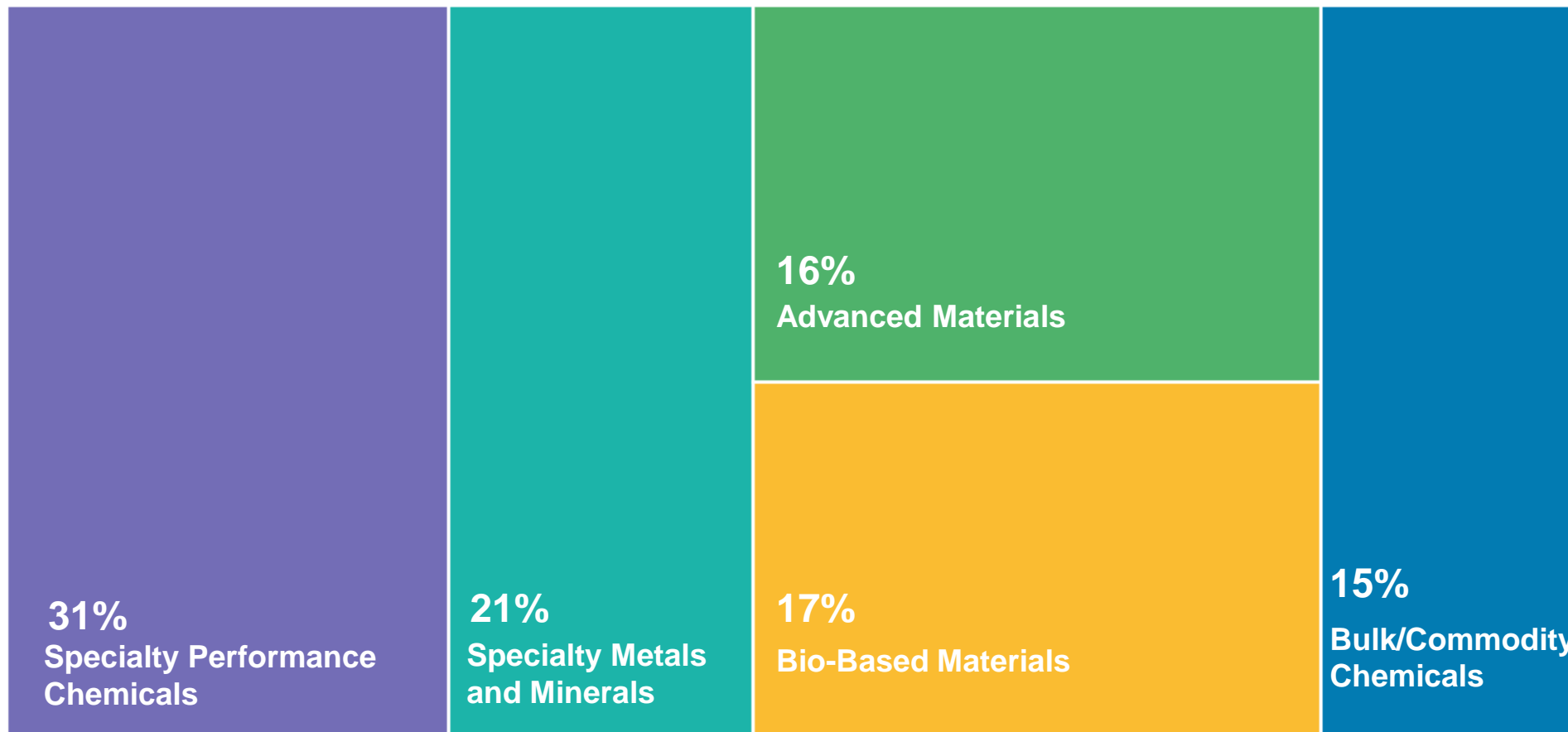


# Advanced Chemicals & Materials Industry – Patent Landscape

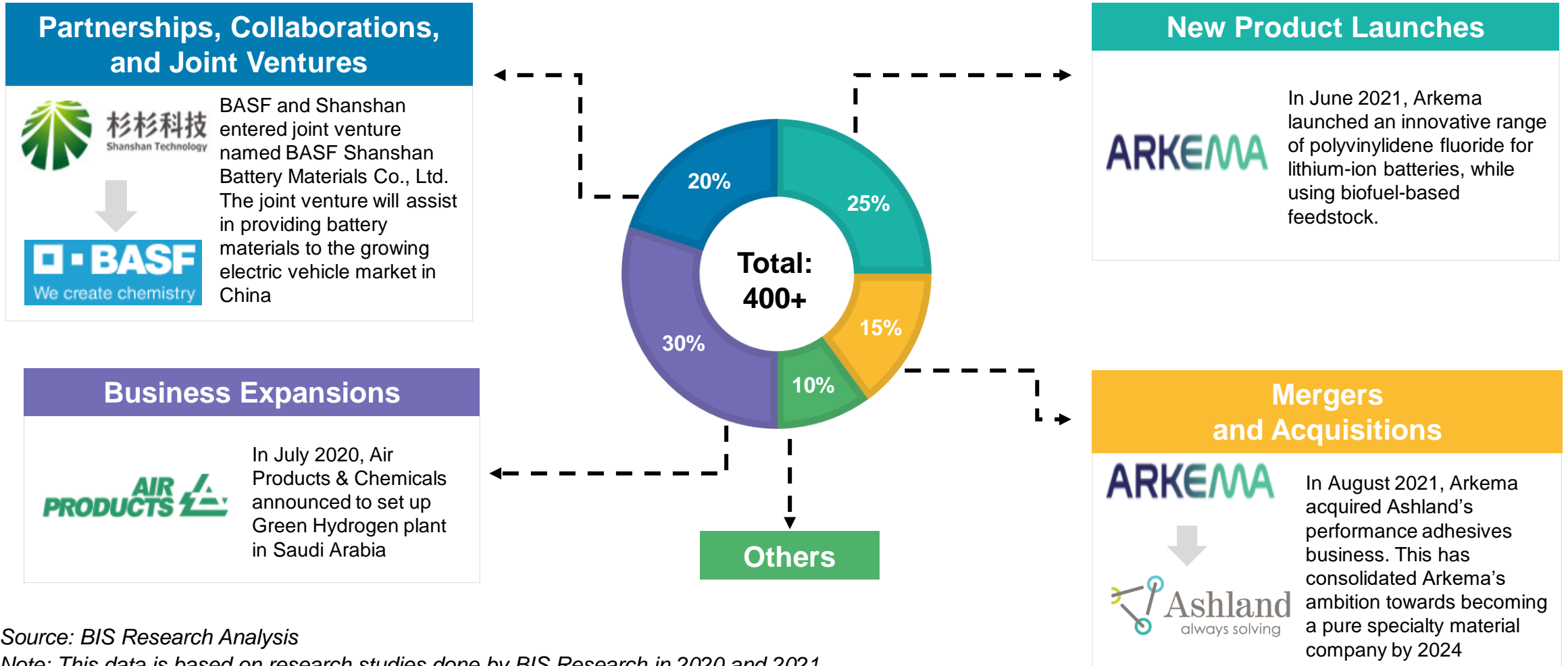


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**Total Patents for Advanced Chemicals & Materials: 800,000+ (2010 Onwards)**



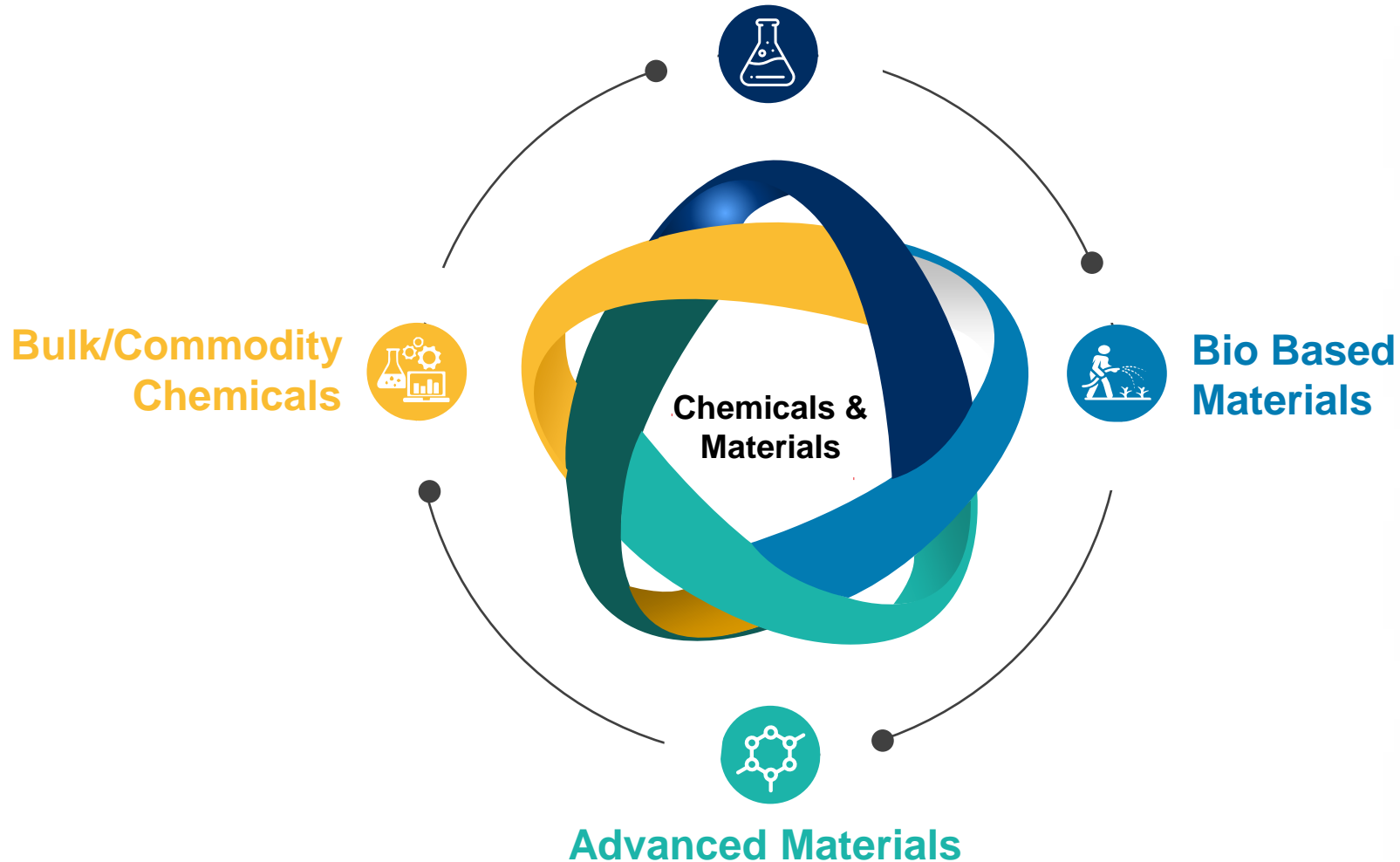
Source: BIS Research Analysis



Source: BIS Research Analysis

Note: This data is based on research studies done by BIS Research in 2020 and 2021

## Specialty Performance Chemicals



Customers

150+

Areas Covered

35+

SKUs Published

100+

Primary Interviews\*

700+

*\*Note: Primary Interviews are estimated based on average interviews done per report in the past*





## Bio-Based Materials

### Driver:

- Growing demand for natural and bio-based products derived from oils and fats
- Government regulations restricting the use of harmful/synthetic ingredients in cosmetics and personal care products

### Opportunity:

- Rising awareness of the potential side-effects of synthetic and petro-based ingredients in cosmetics

## Specialty Performance Chemicals

### Driver :

- Growing demand for lubricating fluid to optimize the efficiency of heavy end-use machinery
- Surging demand for light material such as plastics & composites in several end-use industries such as, automotive and packaging.

### Opportunity:

- Rapid industrialization in developing nations such as India, China, Singapore, and Malaysia.

## Bulk/Commodity Chemicals

### Driver :

- Increasing requirement for industrial gases to manufacture and develop flat panel display products, compound semiconductors, and advanced components, such as silicon wafers and integrated circuits

### Opportunity:

- Rising investment in expansion or new construction of petrochemical plants

## Advanced Materials

### Driver :

- Development of high-performance advanced materials enabling the roll-out of 5g technology
- Surging investments in Space exploration projects

### Opportunity:

- Increasing focus toward adoption of advanced carbon fiber composites and superalloys in the aerospace industry to increase efficiency, optimize performance and reduce the weight of aircraft.

Source: BIS Research Analysis

# ADVANCED MATERIALS

The industry is inclined towards manufacturing sustainable and lightweight advanced materials which can lead to operational efficiency. This has resulted in a plethora of opportunities for advanced composites, advanced ceramics, and others. Companies are constantly striving to launch new products that open new market opportunities. For instance, polymer matrix composites enable the creation of stronger, lighter, and corrosion-resistant products, thereby improving the durability and strength of products for usage in various end-use industries.

BIS Research focuses on providing market intelligence and key insights on advanced chemicals.

## OUR COVERAGE/ USE CASES

- Advanced Composites
- Advanced Ceramics
- Nano Engineered Materials
- High Performance Fabrics & Textiles





# ADVANCED MATERIALS



## Published Titles

- [PP Compound Market for Automotive Industry](#)
- [Plastics Market](#)
- [Silicon Carbide Fibers Market](#)
- [Low Temperature Co-Fired Ceramics Market](#) ★
- [5G Substrate Materials Market](#)
- [High End Synthetic Suede Market](#) ★
- [Heating Fabrics Market](#)
- [High End Synthetic Suede Market](#)
- [Continuous Fiber Composite Market](#)
- [Recyclable Thermoset Market](#)



## Upcoming Titles

- Metal Matrix Composite Market
- Aluminum Ion Batteries Market
- Water and Wastewater Treatment Chemicals Market ★
- Polyurethane Based Automotive Foam Market
- Semiconductor Gases Market
- IoT in Chemical Market
- Bio-Based Cosmetics and Personal Care Ingredients Market ★

★ Update

# BULK / COMMODITY CHEMICALS

The Bulk/commodity chemical includes petrochemical products, industrial gases, and inorganic and organic gases. Petrochemical products are one of the key segments of commodity chemicals.

The demand for petrochemical products has been increasing significantly due to rapid industrialization and urbanization. Petrochemical products find a wide range of applications across various industries such as cloth, tires, fertilizers, packaging, among others. The companies are making significant investments in the expansion and construction of the petrochemical plant to fulfill the rising demand for petrochemical products. For instance, in May 2021, PKN ORLEN announced the expansion of the olefins complex at the petrochemical production plant in Plock (City in Poland).

BIS Research focuses on providing market intelligence and key insights on commodity chemicals

## OUR COVERAGE/ USE CASES

- Petrochemical Products
- Inorganic and Organic Chemicals
- Industrial Gases
- Disinfectants







# BULK / COMMODITY CHEMICALS



## Published Titles

- [Coal Tar](#)
- [Needle Coke](#)
- [North America Sodium Dichromate Market](#)
- [Tungsten Carbide Market](#)



## Upcoming Titles

- Hydrogen Market
- Methanol Market
- Carbon Black Market
- Ammonia Market
- Acetic Acid Market
- Adipic Acid Market
- Industrial Nitrogen Market
- Oxygen Market
- Liquid Nitrogen Market

# SPECIALTY PERFORMANCE CHEMICALS

Specialty performance chemicals are basic chemical derivatives that are manufactured for specific applications. Specialty performance chemicals include adhesives, antibiotics, etc. These chemicals are typically low-volume and high-value products that are sold based on their quality or utility, rather than composition. For instance, antibiotics are produced in low quantities as they are tailored to address the issues related to specific diseases.

China is one of the key consumers of specialty chemicals such as feed additives, construction chemicals, catalysts, and antioxidants.

BIS Research is uniquely positioned to provide market intelligence solutions and research reports on specialty performance chemicals.

## OUR COVERAGE/ USE CASES

- Adhesives
- Agrochemicals
- Specialty Additives
- Paints & Coatings
- Lubricants
- Surfactants/Emollients





# SPECIALTY PERFORMANCE CHEMICALS



## Published Titles

- [Anti-Fingerprint Coating Market](#)
- [Camouflage Coatings Market](#)
- [Surface Treatment Chemicals Market](#)
- [Titanium Nitride Coatings Market](#)
- [Hi-tech Paints and Coatings Market](#)
- [U.V. and Blue Light Blocking Coatings Market](#)
- [Adhesive Foam Tape Market](#)
- [Anti-reflective Coatings Market](#)
- [Automotive Refinish Coating Market](#)



## Upcoming Titles

- Paints & Coating Market
- Food Additives Market
- Lubricant Market
- Plastic Additives Market
- Base Oil Market
- Engine Oil market



# SPECIALTY METALS AND MINERALS

Specialty metals and minerals have become an integral part of the modern world, as it forms an essential part of producing modern aircraft, recreational vehicles, implantable devices, electronic products, buildings, and others. These are some of the major segments under advanced chemicals and materials. Building electrification, rising smarter cities, electric vehicles, construction activities, rapid industrialization, and growth in the electronics sector, among others, are aiding towards the advancement of the specialty metals industry. The futuristic minerals industry is projected to grow at a higher rate, as various countries are focusing on decarbonizing their energy systems. BIS Research focuses on providing market intelligence and key insights on such market dynamics impacting the specialty metals and minerals industry.

## OUR COVERAGE/ USE CASES

- Specialty Metals
- Minerals
- Rare Earth Elements







# SPECIALTY METALS AND MINERALS



## Published Titles

- [Metal 3D Printing Materials Market](#)
- [Metal 3D Printers Market](#)



## Upcoming Titles

- Specialty Metal Foam Market
- Metal Matrix Composite Market
- Permanent Magnet Market
- Rare Earth Metals Market

# BIO-BASED MATERIALS

Bio-based materials have been gaining acceptance across the globe, due to major factors such as waste landfilling and management, resource insufficiency, waste legislation, and the need to reduce energy consumption. Rising concerns related to environmental degradation coupled with stringent government regulations for lowering down the emissions of toxic products are favoring the increased acceptance of bio-based materials. Growing acceptance of sustainable packaging materials is also one of the major factors driving the market. Various world-leading chemical companies are innovating their offerings in order to develop sustainable solutions for end-users. BIS Research is uniquely positioned to provide market intelligence solutions and research reports on emerging solutions in the bio-based materials business.

## OUR COVERAGE/ USE CASES

- Green Chemicals
- Bio-Based Plastics
- Bio-Based Petrochemical Substitutes







# BIO-BASED MATERIALS



## Published Titles

- [Green Hydrogen Market](#)
- [Biomaterials Market](#)
- [Eco-Friendly Bitumen Market](#)



## Upcoming Titles

- Bio-based Cosmetics & Personal Care Ingredients Market
- Bio-Based Ethanol Market
- Green Ammonia Market
- Bio Adhesives Market



## Webinar/Event/Podcast

- Podcast on High Performance Plastics
- Podcast on Green Hydrogen
- Podcast on 5G Substrate Materials



## Analyst Note/Whitepaper

- Rethinking Plastic Waste Management
- Maximizing Benefits of 3D Printing
- Silicone 3D Printing Market (upcoming)



## News Blog

- [Water & Wastewater Treatment Chemicals – Covid-19 Impact](#)



## Media Citation

- [Sustainable Construction Materials](#) - Thomasnet
- [Graphene Enhanced Composite](#)- All About Circuits
- [3D Printing Market](#)- Entrepreneur India



# BIS Advanced Chemicals & Materials Customers



Note: ★ Companies who have engaged with BIS Research on custom projects

# BIS Advanced Chemicals & Materials Customers



Note: ★ Companies who have engaged with BIS Research on custom projects

# BIS Research Has Helped Several Companies Answer Critical Business Questions Related to Chemicals & Materials Industry

1

How is the market for composites fiber (e.g., SIC) in European countries? Who are the key players competing in the market?

2

Which are the key trends that shall define the advanced chemicals and materials industry in the next 10 years?

3

What is the global and regional landscape of green hydrogen? Who are the key participants in the ecosystem?  
What are the emerging trends in the green hydrogen industry?



4

What are the emerging technologies shaping up the low thermal co-fired ceramics market?

5

How competitive would aluminum ion batteries be as compared to lithium-ion batteries vis-a-vis their adoption in electric vehicles?

# CASE STUDY

## STRATEGY TO EXPAND OXYGEN SCAVENGER SOLUTIONS

---

### Business Objective

The client was primarily interested in understanding the market sizes and outlook of different oxygen scavenger forms such as sachet, canister, and resin in different countries/regions. The client was also interested in identifying five key companies involved in each country for oxygen scavengers. The business interest lies in the fact that the organization has been actively involved in the oxygen scavenger market with an established client base and is looking forward to expanding its market presence in this space.

### Key Outcomes:

- Assisted the client in preparing a well-defined market entry strategy to reach target customers and achieve competitive advantage
- Analyzed the average oxygen scavenger pricing that manufacturers/suppliers quote to its customers
- Helped the client in assessing high-growth application areas and regional/country-specific demand for different oxygen scavenger forms based on supply-demand analysis
- Analysis of emerging suppliers with whom the client can collaborate to combine its existing product offerings of oxygen scavengers.





# CASE STUDY

## GLOBAL GREEN HYDROGEN MARKET ANALYSIS

---

### Business Objective

The client, one of the leading hydrogen companies, was primarily interested in learning about the market overview, forecasts, and emerging opportunities for green hydrogen in all the major regions/countries across the globe. The client was also interested in understanding the key strategic initiatives deployed by various stakeholders, patents filed by companies/research institutions, among others

The client has been actively working on innovating in green hydrogen space by collaborating with various manufacturers/suppliers within the value chain.

### Key Outcomes:

- The adoption of green hydrogen by various end-use industries across different European & North American countries including Germany, U.K., France, Italy, Spain, U.S.A, Canada, and others
- Competitive benchmarking for the leading players operating worldwide, aided the client in identifying the expansion opportunities relative to the market concentration
- Detailed analysis on the green hydrogen market for the different applications and technologies, helped the client in identifying key growth areas



# CASE STUDY

## MARKET OPPORTUNITY ANALYSIS OF SILICON CARBIDE FIBERS

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The client, one of the leading manufacturers of silicon carbide (SiC) fibers, was primarily interested in the assessment of the emerging opportunities for SiC fibers in various end-use industries. The client was also interested in understanding the market share analysis, competitive benchmarking, strategic development activities of key players operating within this space.

The client's focus has been on collaborating with different stakeholders involved across the supply chain, to stay ahead of the curve.

### Key Outcomes:

- Analyzed the market penetrations of SiC fibers in various end-use industries such as aerospace, energy and power, and others
- Detailed analysis of different fiber types and usage types of SiC fibers at each region/country levels
- Product benchmarking was performed for each of the fiber types, based on their market shares and market growth rates.





**INEOS  
STYROLUTION**

“

BIS research has been a great support to our strategic investigation in the field of thermoplastic composite. BIS delivered in a relatively short period of time and at a competitive price, an in-depth analysis on a very difficult and complex industry driven by different processing technologies and different industry trends.

BIS did manage to bring together a clear picture on a global level, supported by examples and references and they delivered an accurate evaluation of the current market size and potential in the coming years in line with our expectations.

I warmly recommend them.”

**Pierre Juan, Vice President,  
Future Business and Innovation**







I found the content quite interesting and insightful. It has provided us with some important information”

**Strategic Insights COE Manager,  
Japan Tobacco International**





**TEKNA**



I appreciate the extra effort that team BIS took to cater to our specific requirements, moreover, their response time and adaptability is at par with my expectation”

**Luc Dione, CEO & Chairman,  
TEKNA Plasma Systems**





I would like to extend our appreciation for your support in finalizing the report according to our precise needs and prerequisites. I am also impressed by the timely completion of all aspects of dealing with us as your esteemed client. I look forward to continue our professional relations in the future.

**Manager-Strategy & Business Development,  
ICL Industrial Products**



## 01. Bottom-up Analysis of the Supply Side

- Mapping of Manufacturers / Suppliers w.r.t the Product Type and End User in Each Country
- Calculate the Sum of Volume and Total Revenue for Each Product Segments in a Country. This Insight is Derived from data of Key / Leading Players of that Segment in That Country
- Sum of Country-Level Segmental Data to Obtain Regional Segmental Demand as well as the Global Segmental Demand



## 02. Bottom-up Analysis of the Demand Side

- Identification of the Current and Potential Customer Base (Applications) in Each Country for The Relevant Products in Scope
- Estimating an Adoption Rate (Year-on-Year) across Applications by the Customer Base in That Country. Specific Need-based Adoption Is Considered.
- Sum of Country Level Application(s) Specific Data to Obtain Regional Demand as well as the Global Demand



## 03. Top-down Analysis of the Demand Side



- Global Market Size of the Product Category to Which the Product in Focus Belongs.
- % Breakdown of the Global Market Size into Countries Based-on <Source>. Country-level Data is Subsequently Rolled-up to Obtain Region Level Data
- %Penetration of the Product in Focus to Obtain Its Market Size in a Country
- %Breakdown of the Product Market Size in That Country into the Different Segments of the Study

## 04. Data Triangulation



- Verification of Outcomes Through Analysis of Micro and Macro Economic Trends
- Validation of Potential Outcomes with Experienced Industry Professionals
- Optimization of the Results from Bottom-up and Top-down Analysis to Create a Consensus View



## Data Sources

### Primary Data Sources

OEMs/  
Manufacturers

Tier 1 Suppliers

Tier 2 Suppliers

Consortiums &  
Associations

Chemical &  
Materials  
Providers

Academia and  
Research

### Secondary Data Sources

#### Associations

Publications by associations that promote the relevant technology.

For Instance,

- ICIS
- Chemical Industries Association (CIA)
- Indian Chemical Council
- Japan Chemical Industry Association (JCIA)

#### Government Publications

Publications by government bodies, that release regulatory notes as well as a country's position in developing/adopting a particular technology.

For Instance,

- Department of Chemicals & Petrochemicals
- United States Geological Survey (USGS)
- World Bank Group
- U.S. Department of Energy

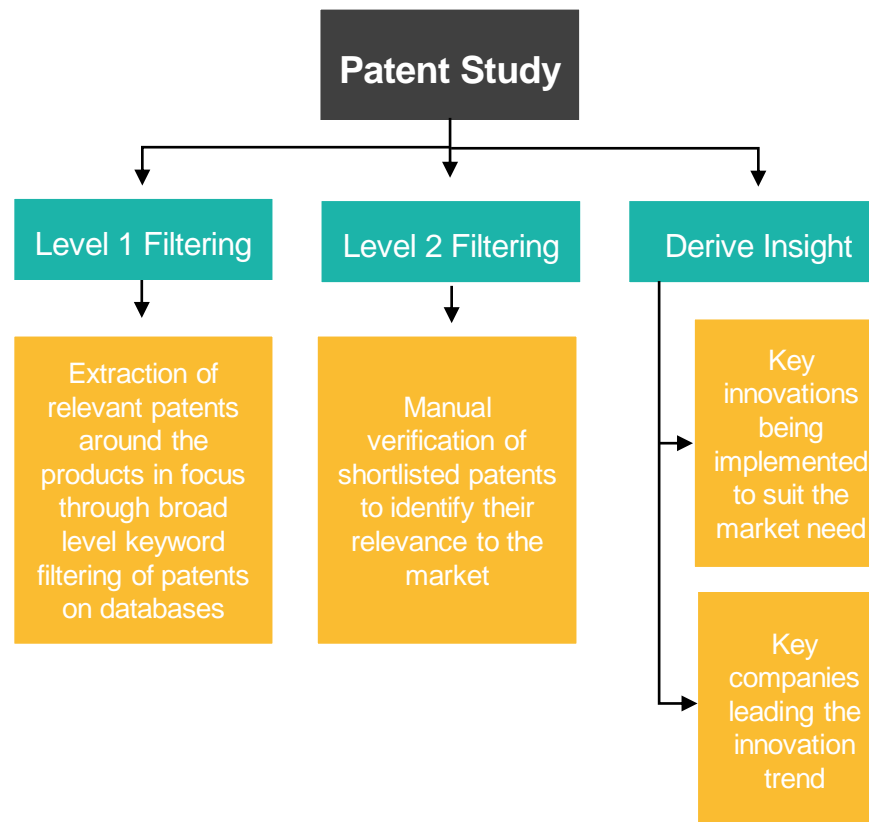
#### Annual Reports and Investor Presentation

Publications by companies regarding their revenue breakdowns as well as industry data.

#### Articles and Press Releases

News as well as updates on recent developments over the internet.

## PATENTS



**Patent Study to Identify Technological Trends and Company-level Innovation Focus Areas**

## Insight Monk



InsightMonk, the global deep-technology ecosystem, helps businesses and individuals accelerate technology discovery, business evaluation, and innovation planning. The ecosystem empowers enterprises, startups, and individuals to improve their deep-tech research capabilities by offering crowdsourced innovative thinking and solutions from the world's smartest individuals in a timely, cost-effective, and secure manner. It also gives the expert a valuable opportunity to contribute to path-breaking projects, impact the future of society, grow their market equity, and gain extra rewards for their expertise.

**Company, Industry, and Market Specific Insights**

# Thank You



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