

Saudi Arabia Adsorbents Market, By Type (Activated Carbon, Molecular Sieves, Silica Gel, Others), By Application (Petroleum Refining, Gas Refining, Water Treatment, Others), By Region, Competition, Forecast and Opportunities, 2028

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Abstracts

Saudi Arabia Adsorbents Market size was valued at USD111.55 million in 2022 and is anticipated to increase at a CAGR of 3.67% in the forecast period 2028F. Adsorbent materials are utilized in various industrial processes like filtration, separation, drying, spill management, catalysis, and pollution control. Adsorption is a phenomenon that occurs on surfaces and is used to remove one substance from a combination of substances. The electrostatic force of attraction causes solid-liquid interaction when dissolved salts and solid adsorbents get into contact. Physisorption and chemisorption are two different types of electrostatic attraction. Adsorbent and adsorbate combine through Van Der Waal forces in physisorption, which is a reversible process.

Adsorption is used to extract hydrocarbon vapors produced by gasoline using charcoal in a system known as a vehicle's 'onboard' vapor recovery system. Adsorption is a crucial process in the petroleum industry. Sulfur from the oil can be recovered or removed using it. Adsorption plays a role in catalytic reactions as well. The process of adsorption makes it possible to remove a variety of toxins from wastewater. Adsorption can be used to treat waste gases. Numerous applications are used in a variety of sectors. With inexpensive adsorbent and effective regeneration techniques, there is room to reduce the costs associated with these activities.

Increasing Demand for Waste Treatment

Adsorbents used in the treatment of slurry of solid waste materials are activated carbon,

and as a result, water is not able to desorb the target substances over time. The degree of adsorption and resistance to desorption must be determined by comprehensive testing.. According to United Nations, in 2020, 56 % of global household wastewater flows were safely treated (estimated data from 128 countries representing 80% of the global population). To achieve Saudi Arabia's most important initiative "Vision 2030", water treatment plants are going to play major roles. Government agencies and private player are signing MOU to setup new plant or enhance the existing capacity of the region. In water treatment plant, adsorbent is used for the elimination of dissolved impurities such as oils, chemicals, tiny metal particles present in the wastewater. Activated carbon, chitosan, zeolite, and clay minerals are adsorbent that are frequently used in water treatment plants. Hence, the demand for adsorbent is expected to rise in the forecasted period.

Rising Demand for Oxygen Concentrators

Adsorbents that are capable of adsorbing carbon dioxide include activated carbon, carbon fibers, silica gel, activated alumina, zeolites, ion exchange resins, and layered double hydroxides. Pressure Swing Adsorption technology is used to separate the mixture of gas species under pressure, according to their molecular structure, properties, and affinity of the adsorbent. Zeolites are a class of crystalline substances with uniformly sized pores and a network of tunnels. Because zeolites can operate at higher temperatures and totally regenerate after adsorption, it is an effective adsorbent for many non-volatile (organic) substances.

Flourishing Gas Refinery

Activated carbon and silica gel are the major adsorbent used by gas refinery. In gas refinery, different methods or process are used to efficiently deal with a wide range of gas separations including gas purification, impurity removal, and separation in recycle streams. Saudi Arabia is ranked as sixth-largest natural gas producer worldwide. In 2020, the region recorded production of natural gas which was 30% higher from 2010, and this amounted to reach an average of 11 billion cubic feet/day. As the production of natural gas is rising, the region due to favorable demand scenario and government policies is expected to have significant growth in adsorbent market.

Increasing Demand for Petroleum and Petrochemical Products

Adsorbent in petrochemical industries is used for eliminating traces of contaminants like water and sulfur in raw, intermediate, and product streams. Saudi Arabia is a global

leader in the production of petrochemicals and plastics which represent 35 percent of non-oil exports in the region. Furthermore, different petrochemical manufacturing project & plants are planned to establish in the region. Where, adsorbent is used to eliminate the detrimental contaminants and produce high-purity feedstocks for smooth functioning of the plant. All these factors, led to upsurge demand of adsorbent in petrochemical industry.

New Technology

Cellulose, hemicellulose, and lignin add to most agricultural waste. These substances are frequently used to remove pollutants from wastewater because they have been proven to be effective adsorbents. Due to their high carbon content, abundant availability, and inexpensive price with a wide range of applications. They have reportedly been used extensively to get rid of colors, heavy metals, and pharmaceutical pollutants. Few scientists have used agricultural waste to eliminate pharmaceutical contaminants over the past decade. Although, a small number of antibiotics could successfully eliminate using agricultural waste. Several agricultural wastes, including cocoa shells, wheat barns, and bamboo, have been successfully employed to create commercially viable adsorbents to remove some anti-inflammatory medications. Agro-industry is a type of economic activity that develops food products by fusing agricultural and industrial operations. Agro-industrial wastes are produced as a byproduct of this activity from raw material planting for its commercialization. Due to the high costs of eventual disposal, these pollutants become both an environmental and an economic burden. Over 72 million tonnes of agro-industrial waste are produced annually, with palm oil residues standing out. In the palm business, 17% of the weight of a bunch of fresh fruit is equivalent to fiber residues (around 500 t/year) that are not used. Making adsorbent materials is one common application for fiber.

Recent Developments

Due to the appealing mechanical characteristics of polymeric adsorbents; their moderate surface area, favorable pore size distribution, viability of regeneration under mild conditions, flexible surface chemical framework, and selectivity for heavy metal ions; polymer adsorbents are emerging as alternatives to other types of adsorbents. Mercaptan, amino, and amino group-containing polymers are causing increasing worry due to their wide spectrum of heavy metal ions and

superior adsorption capabilities over other light metal ions and dyes. Nanomaterials and polymers are two of the most promising emerging materials for wastewater treatment. They have special functional qualities that can be changed to meet the needs of different wastewater treatment systems. Polymer nanocomposites, a particular family of compounds, improve performance by combining nanoparticles with the advantageous characteristics of polymers. Of course, the development of these kinds of functional materials requires a thorough understanding of the fundamental properties of these materials as well as the underlying science. Due to the presence of specific functional groups that may mix well with various pollutants, polymers like polypyrrole (PPy) and polyaniline, as well as their composites, are increasingly being considered for ecological wastewater remediation.

Market Segmentation

Saudi Arabia Adsorbents Market is segmented based on type and application. Based on type, the market is divided into activated carbon, molecular sieves, silica gel, and others. Based on application, the market is segmented into petroleum refining, gas refining, water treatment, and others.

Market Players

BASF Saudi Arabia Co. Ltd., Honeywell UOP, Arkema, Cabot Corporation, Axens Catalyst Arabia Ltd (ACAL), Sinopec Catalyst Co. Ltd., Shell plc (Shell Catalysts & Technologies), SABIC Industrial Catalyst Company, Clariant Speciality Solutions, and AFI Group are some of the key players operating in the Saudi Arabia Adsorbents Market.

Report Scope:

In this report, Saudi Arabia Adsorbents Market has been segmented into following categories, in addition to the industry trends which have also been detailed below:

Saudi Arabia Adsorbents Market, By Type:

Activated Carbon

Molecular Sieves

Silica Gel

Others

Saudi Arabia Adsorbents Market, By Application:

Petroleum Refining

Gas Refining

Water Treatment

Others

Saudi Arabia Adsorbents Market, By Region:

Eastern

Northern & Central

Western

Southern

Competitive Landscape

Company Profiles: Detailed analysis of the major companies present in Saudi Arabia Adsorbents Market.

Available Customizations:

With the given market data, TechSci Research offers customizations according to a company's specific needs. The following customization options are available for the report:

Company Information

Detailed analysis and profiling of additional market players (up to five).

Contents

1. PRODUCT OVERVIEW

- 1.1. Market Definition
- 1.2. Scope of the Market
 - 1.2.1. Markets Covered
 - 1.2.2. Years Considered for Study
 - 1.2.3. Key Market Segmentations

2. RESEARCH METHODOLOGY

- 2.1. Objective of the Study
- 2.2. Baseline Methodology
- 2.3. Key Industry Partners
- 2.4. Major Association and Secondary Sources
- 2.5. Forecasting Methodology
- 2.6. Data Triangulation & Validation
- 2.7. Assumptions and Limitations

3. EXECUTIVE SUMMARY

- 3.1. Overview of the Market
- 3.2. Overview of Key Market Segmentations
- 3.3. Overview of Key Market Players
- 3.4. Overview of Key Regions/Countries
- 3.5. Overview of Market Drivers, Challenges, and Trends

4. VOICE OF CUSTOMER

- 4.1. Brand Awareness
- 4.2. Demand for Adsorbents, By Type
- 4.3. Demand for Adsorbents, By Application

5. DEMAND SUPPLY ANALYSIS

6. SAUDI ARABIA ADSORBENTS MARKET OUTLOOK

- 6.1. Market Size & Forecast

- 6.1.1. By Value & Volume
- 6.2. Market Share & Forecast
 - 6.2.1. By Type (Activated Carbon, Molecular Sieves, Silica Gel, Others)
 - 6.2.2. By Application (Petroleum Refining, Gas Refining, Water Treatment, Others)
 - 6.2.3. By Region (Northern & Central, Eastern, Western, and Southern)
 - 6.2.4. By Company (2022)
- 6.3. Market Map
 - 6.3.1. By Type
 - 6.3.2. By Application
 - 6.3.3. By Region

7. NORTHERN & CENTRAL SAUDI ARABIA ADSORBENTS MARKET OUTLOOK

- 7.1. Market Size & Forecast
 - 7.1.1. By Value
- 7.2. Market Share & Forecast
 - 7.2.1. By Type
 - 7.2.2. By Application

8. EASTERN SAUDI ARABIA ADSORBENTS MARKET OUTLOOK

- 8.1. Market Size & Forecast
 - 8.1.1. By Value
- 8.2. Market Share & Forecast
 - 8.2.1. By Type
 - 8.2.2. By Application

9. WESTERN SAUDI ARABIA ADSORBENTS MARKET OUTLOOK

- 9.1. Market Size & Forecast
 - 9.1.1. By Value
- 9.2. Market Share & Forecast
 - 9.2.1. By Type
 - 9.2.2. By Application

10. SOUTHERN SAUDI ARABIA ADSORBENTS MARKET OUTLOOK

- 10.1. Market Size & Forecast
 - 10.1.1. By Type

- 10.1.2. By Value
- 10.2. Market Share & Forecast
 - 10.2.1. By Type
 - 10.2.2. By Application

11. MARKET DYNAMICS

- 11.1. Drivers
- 11.2. Challenges

12. MARKET TRENDS & DEVELOPMENTS

- 12.1. Mergers & Acquisitions
- 12.2. Recent Trends & Developments
- 12.3. New Type Launches

13. POLICY AND REGULATORY LANDSCAPE

14. PRICING ANALYSIS

15. SAUDI ARABIA ECONOMIC PROFILE

16. PORTERS FIVE FORCES ANALYSIS

- 16.1. Competition in the Industry
- 16.2. Potential of New Entrants
- 16.3. Power of Suppliers
- 16.4. Power of Customers
- 16.5. Threat of Substitute Types

17. COMPETITIVE LANDSCAPE

- 17.1. Business Overview
- 17.2. Company Snapshot
- 17.3. Types & Services
- 17.4. Financials (In case of listed companies)
- 17.5. Recent Developments
- 17.6. SWOT Analysis
 - 17.6.1. BASF Saudi Arabia Co. Ltd.

- 17.6.2. Honeywell UOP
- 17.6.3. Arkema
- 17.6.4. Cabot Corporation
- 17.6.5. Axens Catalyst Arabia Ltd (ACAL)
- 17.6.6. Sinopec Catalyst Co. Ltd.
- 17.6.7. Shell plc (Shell Catalysts & Technologies)
- 17.6.8. SABIC Industrial Catalyst Company
- 17.6.9. Clariant Speciality Solutions
- 17.6.10. AFI Group

18. STRATEGIC RECOMMENDATIONS

19. ABOUT US & DISCLAIMER

List Of Figures

LIST OF FIGURES

Figure 1: Saudi Arabia Adsorbents Market Size, By Value (USD Million), 2018-2028F

Figure 2: Saudi Arabia Adsorbents Market Size, By Volume (Thousand Tonnes), 2018-2028F

Figure 3: Saudi Arabia Adsorbents Market Share, By Type, By Value, 2018-2028F

Figure 4: Saudi Arabia Adsorbents Market Share, By Application, By Value, 2018-2028F

Figure 5: Saudi Arabia Adsorbents Market Share, By Region, By Value, 2018-2028F

Figure 6: Saudi Arabia Adsorbents Market Share, By Company, By Value, 2022

Figure 7: Saudi Arabia Adsorbents Market Map, By Type, Market Size (USD million) & Growth Rate (%), 2022

Figure 8: Saudi Arabia Adsorbents Market Map, By Application, Market Size (USD Million) & Growth Rate (%), 2022

Figure 9: Saudi Arabia Adsorbents Market Map, By Region, Market Size (USD Million) & Growth Rate (%), 2022

Figure 10: Northern & Central Saudi Arabia Adsorbents Market Size, By Value (USD Million), 2018-2028F

Figure 11: Northern & Central Saudi Arabia Adsorbents Market Share, By Type, By Value, 2018-2028F

Figure 12: Northern & Central Saudi Arabia Adsorbents Market Share, By Application, By Value, 2018-2028F

Figure 13: Eastern Saudi Arabia Adsorbents Market Size, By Value (USD Million), 2018-2028F

Figure 14: Eastern Saudi Arabia Adsorbents Market Share, By Type, By Value, 2018-2028F

Figure 15: Eastern Saudi Arabia Adsorbents Market Share, By Application, By Value, 2018-2028F

Figure 16: Western Saudi Arabia Adsorbents Market Size, By Value (USD Million), 2018-2028F

Figure 17: Western Saudi Arabia Adsorbents Market Share, By Type, By Value, 2018-2028F

Figure 18: Western Saudi Arabia Adsorbents Market Share, By Application, By Value, 2018-2028F

Figure 19: Southern Saudi Arabia Adsorbents Market Size, By Value (USD Million), 2018-2028F

Figure 20: Southern Saudi Arabia Adsorbents Market Share, By Type, By Value, 2018-2028F

Figure 21: Southern Saudi Arabia Adsorbents Market Share, By Application, By Value, 2018-2028F

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