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Global Chemically Synthesized Alanyl-Glutamine Market Growth 2026-2032

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Abstracts

The global Chemically Synthesized Alanyl-Glutamine market size is predicted to grow from US$ 54.93 million in 2025 to US$ 81.60 million in 2032; it is expected to grow at a CAGR of 5.7% from 2026 to 2032.

In 2025, the global sales volume of chemically synthesized alanyl-glutamine reached 516 metric tons, with an average price of $108.9 per kilogram.

Chemically synthesized alanyl-glutamine (Ala-Gln) refers to a production method that utilizes organic synthesis techniques—such as protecting group strategies, condensation reactions, and deprotection steps—to specifically link L-alanine and L-glutamine (or L-glutamic acid) into a dipeptide. Chemical synthesis methods primarily include liquid-phase synthesis (SPS) and solid-phase peptide synthesis (SPPS), with liquid-phase synthesis serving as the mainstream route for industrial production. The core concept of this method involves introducing protecting groups (such as benzyloxycarbonyl/CBz or tert-butoxycarbonyl/Boc) to shield the ?-amino or carboxyl groups of the amino acids and prevent side reactions; subsequently, a condensation agent (such as DCC or the hexachloroethane/triphenylphosphine system) catalyzes the formation of the peptide bond, followed by the removal of protecting groups to yield the final product.

The raw material system for chemically synthesized alanyl-glutamine comprises five major categories: amino acid raw materials, protecting group reagents, condensation agents, solvents and catalysts, and ammonolysis reagents. Amino acid raw materials represent the primary cost component, consisting mainly of L-alanine and L-glutamine (or L-glutamic acid as a substitute). Among these, L-glutamine—valued for its dual utility as a pharmaceutical raw material and a biochemical food ingredient—is in high demand with steadily rising prices, making it a key factor driving up synthesis costs; conversely,

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L-glutamic acid is relatively inexpensive and readily available, prompting some companies to develop new production routes using L-glutamic acid to reduce raw material costs. Protecting group reagents include di-tert-butyl dicarbonate (for Boc protection), benzyl chloroformate (for CBz protection), and phthalic anhydride; these are used for the temporary protection of amino acid functional groups and are characterized by high unit prices and significant consumption volumes. Condensing agents such as N,N'-dicyclohexylcarbodiimide (DCC), hexachloroethane, and triphenylphosphine are used to catalyze peptide bond formation; however, DCC is expensive, and the dicyclohexylurea (DCU) byproduct generated after the reaction is highly toxic and difficult to remove. Solvents and catalysts include organic solvents like tetrahydrofuran, dichloromethane, acetone, methanol, thionyl chloride, and trifluoroacetic acid (TFA), as well as catalysts for hydrogenation, such as palladium on carbon (Pd/C). Ammonolysis reagents—primarily concentrated aqueous ammonia or liquid ammonia—are used to convert acyl chloride or ester groups into amide groups.

Regarding the cost structure, raw materials typically account for 50%–70% of the total cost in chemical synthesis, with L-glutamine (or L-glutamic acid) and protecting group reagents representing the largest expenditures; chiral reagents (such as D-?-chloropropionyl chloride) are extremely expensive, severely constraining large-scale industrial production. Solvent and reagent costs account for approximately 15%–25%; large quantities of organic solvents are consumed, recovery costs are high, and certain solvents (e.g., dichloromethane, tetrahydrofuran) are toxic and volatile, resulting in high environmental treatment expenses. Equipment and energy costs make up about 10%–15%; chemical synthesis involves multi-step reactions, low-temperature control, vacuum concentration, and catalytic hydrogenation, placing high demands on equipment such as reaction vessels, distillation columns, and hydrogenation reactors, while also entailing significant energy consumption. Labor and environmental costs account for 5%–15%; the synthesis process involves numerous complex steps requiring highly skilled technical personnel, and the treatment of generated waste liquids, gases, and solids (such as DCU byproducts) is difficult and costly in terms of environmental compliance. Additionally, downstream purification costs (crystallization, recrystallization, column chromatography, etc.) constitute a significant portion of the total, as chemically synthesized products often contain impurities such as racemates and tripeptide or tetrapeptide byproducts, necessitating complex purification processes. Overall, although chemical synthesis methods feature mature processes and controllable reactions, their total production costs are significantly higher than those of fermentation or enzymatic methods. This is due to a reliance on chiral reagents and expensive protecting groups, complex multi-step procedures, low overall yields (typically 40–60%), and high costs associated with waste treatment; consequently, industrial production has increasingly

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shifted toward biosynthetic methods in recent years.

United States market for Chemically Synthesized Alanyl-Glutamine is estimated to increase from US$ million in 2025 to US$ million by 2032, at a CAGR of % from 2026 through 2032.

China market for Chemically Synthesized Alanyl-Glutamine is estimated to increase from US$ million in 2025 to US$ million by 2032, at a CAGR of % from 2026 through 2032.

Europe market for Chemically Synthesized Alanyl-Glutamine is estimated to increase from US$ million in 2025 to US$ million by 2032, at a CAGR of % from 2026 through 2032.

Global key Chemically Synthesized Alanyl-Glutamine players cover Shandong Chenghui Pharmaceutical Group, Evonik, Minsheng Group Shaoxing Pharmaceutical, Yangzhou NO.3 Pharmacitical Manufacture, etc. In terms of revenue, the global two largest companies occupied for a share nearly % in 2025.

LP Information, Inc. (LPI) ' newest research report, the “Chemically Synthesized Alanyl-Glutamine Industry Forecast” looks at past sales and reviews total world Chemically Synthesized Alanyl-Glutamine sales in 2025, providing a comprehensive analysis by region and market sector of projected Chemically Synthesized Alanyl-Glutamine sales for 2026 through 2032. With Chemically Synthesized Alanyl-Glutamine sales broken down by region, market sector and sub-sector, this report provides a detailed analysis in US$ millions of the world Chemically Synthesized Alanyl-Glutamine industry.

This Insight Report provides a comprehensive analysis of the global Chemically Synthesized Alanyl-Glutamine landscape and highlights key trends related to product segmentation, company formation, revenue, and market share, latest development, and M&A activity. This report also analyzes the strategies of leading global companies with a focus on Chemically Synthesized Alanyl-Glutamine portfolios and capabilities, market entry strategies, market positions, and geographic footprints, to better understand these firms’ unique position in an accelerating global Chemically Synthesized Alanyl-Glutamine market.

This Insight Report evaluates the key market trends, drivers, and affecting factors shaping the global outlook for Chemically Synthesized Alanyl-Glutamine and breaks down the forecast by Type, by Application, geography, and market size to highlight

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emerging pockets of opportunity. With a transparent methodology based on hundreds of bottom-up qualitative and quantitative market inputs, this study forecast offers a highly nuanced view of the current state and future trajectory in the global Chemically Synthesized Alanyl-Glutamine.

This report presents a comprehensive overview, market shares, and growth opportunities of Chemically Synthesized Alanyl-Glutamine market by product type, application, key manufacturers and key regions and countries.

Segmentation by Type:

Liquid-Phase Synthesis (SPS)

Solid-Phase Synthesis (SPPS)

Segmentation by Purity:

?95%

?98%

?99%

Segmentation by Protecting Group Types:

CBz (Carbobenzyloxy) Protection

Boc (tert-Butyloxycarbonyl) Protection

Phthaloyl Protection

Segmentation by Application:

Pharmaceuticals Industry

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Food & Beverages

Sports Nutrition & Supplements

Animal Feed

Others

This report also splits the market by region:

Americas

United States

Canada

Mexico

Brazil

APAC

China

Japan

Korea

Southeast Asia

India

Australia

Europe

Germany

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France

UK

Italy

Russia

Middle East & Africa

Egypt

South Africa

Israel

Turkey

GCC Countries

The below companies that are profiled have been selected based on inputs gathered from primary experts and analysing the company's coverage, product portfolio, its market penetration.

Shandong Chenghui Pharmaceutical Group

Evonik

Minsheng Group Shaoxing Pharmaceutical

Yangzhou NO.3 Pharmacitical Manufacture

Key Questions Addressed in this Report

What is the 10-year outlook for the global Chemically Synthesized Alanyl-

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Glutamine market?

What factors are driving Chemically Synthesized Alanyl-Glutamine market growth, globally and by region?

Which technologies are poised for the fastest growth by market and region?

How do Chemically Synthesized Alanyl-Glutamine market opportunities vary by end market size?

How does Chemically Synthesized Alanyl-Glutamine break out by Type, by Application?

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