

MCP SERVER

NO CODE

CLOUD HOSTED

Adipic Acid Plant Design Suite MCP

Model chemical kinetics and environmental impact for Nylon 6,6 production.

Adipic Acid Plant Design Suite MCP gives your AI client the specialized math needed for industrial chemical engineering. You can calculate cyclohexane feedstock needs, model N2O emissions, and evaluate recycling loop efficiency to ensure your plant design meets both production targets and environmental regulations.

A+ Quality Score 100/100

adipic-acid

nylon-66

chemical-engineering

emissions-modeling

industrial-design



The connectivity layer between AI and the world's software.

Vinkius sits between AI and every application. All communication passes through Vinkius Cloud via the Model Context Protocol (MCP) — with governance, observability, and security at every layer.

Your AI Connections Run Through Vinkius Cloud

The world's largest
managed MCP catalog

Vinkius is the connectivity layer where AI connects to the software your business already runs. We handle the hosting, the security, the credentials, the uptime — you get agents that actually do things.

We operate the world's largest managed MCP catalog. Major SaaS platforms, CRMs, databases, and cloud providers — running, monitored, production-ready. This MCP server is hosted and maintained by the Vinkius Cloud for AI Agents.

The agent doesn't manage credentials, doesn't manage uptime, doesn't manage security. Vinkius does.

— Architecture principle

Four Pillars of the Vinkius Runtime

01 — Security by design

Credentials stay encrypted at rest via AES-256. The AI agent never touches raw keys — they're injected into a sandboxed V8 isolate at runtime. Actions are logged, and connections have an emergency kill switch.

03 — Deterministic observability

Eight immutable metrics per endpoint: request volume, p95 latency, error rate, active connections, cost attribution. A live payload feed logs every tool call with mutation detection.

02 — Built on MCP Fusion

This MCP server was built with **MCP Fusion**, the open-source framework (Apache 2.0) that powers the entire Vinkius catalog. Schema-as-firewall strips undeclared fields, compiled PII redaction runs at zero overhead, and cryptographic lockfiles produce git-diffable audit trails.

04 — Autonomous operations

Servers are deployed, monitored, and patched autonomously. New capabilities and security patches ship weekly. Zero-downtime deployments ensure continuous availability across all managed MCP servers.

AES-256

Encryption at rest

Ed25519

PKI vault signatures

24h TTL

Ephemeral session keys

V8 Isolate

Sandboxed execution

One Token. Instant Access.

Every MCP server on Vinkius is accessed through a **Connection Token**. Tokens are generated in the cloud dashboard and produce a unique MCP endpoint URL. Paste this URL into any MCP-compatible client — no SDK required.

A single token can serve **multiple AI clients simultaneously**, or you can issue separate tokens per client for granular access control. Each token tracks its own request count, last activity timestamp, and can be individually enabled or revoked.

MCP ENDPOINT`https://edge.vinkius.com/{token}/mcp`

Claude



Cursor



VS Code



Windsurf



Grok



Gemini

Security Is the Architecture

Security in Vinkius is not a feature — it's the foundation of the runtime. The gateway enforces multiple independent protection layers between AI agents and third-party APIs.

01 — Ed25519 PKI Vault

Every workspace has an Ed25519 Master Key. Session keys are generated ephemerally (24h TTL) and signed by the Master Key. Credentials never leave the vault boundary.

02 — V8 Isolate Sandboxing

Tool code runs inside isolated-vm V8 isolates with 64 MB memory caps and per-request timeouts. No filesystem access, no network access except through the SSRF-guarded fetch bridge.

03 — SSRF Guard

All outbound HTTP requests are DNS-resolved and validated before execution. Private IP ranges (10.x, 172.16-31.x, 192.168.x, AWS metadata 169.254.x) are blocked at the network layer.

05 — Cryptographic Audit Trail

Every request is signed into a SHA-256 hash chain with Ed25519 signatures. Events form a tamper-proof, SIEM-exportable forensic record.

04 — DLP & PII Redaction

A ResponseGuard pipeline intercepts every tool response. Configurable redaction patterns strip sensitive fields (emails, SSNs, card numbers) before data reaches the AI agent.

06 — Honeypot Trap System

Phantom credentials are injected into isolated environments. If a honeypot is used outside Vinkius infrastructure, the server is quarantined instantly.

Emergency Kill Switch

EU AI Act Art. 14(1)
Compliant

The kill switch is an **emergency halt** mechanism — not a simple toggle. When triggered, it executes three actions atomically:

01 — Server deactivated

The MCP server is immediately taken offline across the entire cluster.

02 — All tokens revoked

Every connection token is invalidated. Total lockout — reconnection blocked until new tokens are issued.

03 — WebSocket connections killed

Active connections terminated via Redis pubsub broadcast. Propagates to every runtime node in the cluster.

Full Visibility. Zero Guesswork.

The Vinkius cloud dashboard includes a full MCP Governance suite — real-time analytics and security controls for production AI operations.

Control Plane

KPI dashboard with request volume, latency, success rate, token consumption, and AI-generated operational briefings.

FinOps

Cost tracking per tool, payload compression savings, budget optimization signals, and consumption trends.

Firewall & DLP

PII redaction activity, sensitive data protection counters, and security event timeline.

Agent Activity

Which AI clients are connecting, how often, and what they're doing — real-time session tracking.

Tool Health

Slowest and most error-prone tools, with actionable root-cause insights and performance baselines.

Incident Log

Error trends, failure rates, status-code breakdowns, and forensic audit trail access.

Get started at cloud.vinkius.com — connect your AI agent in under 60 seconds.

Adipic Acid Plant Design Suite MCP

4 tools available

Cloud-hosted on Vinkius

You can use this MCP to handle the heavy lifting of chemical process modeling for adipic acid production. Instead of manually running complex formulas, you tell your AI client what your production targets are, and it handles the stoichiometry and environmental forecasting. It's built specifically for the production of Nylon 6,6, focusing on the balance between chemical kinetics and regulatory compliance. You can determine exactly how much cyclohexane you need to hit a specific tonnage or predict how much nitrogen oxide your facility will release based on your abatement system's efficiency. It also helps you look at the bigger picture by evaluating how recycling unreacted components affects your overall plant efficiency. This makes it a practical tool for designing more stable and compliant industrial processes.

Core Capabilities

01 — Feedstock Calculation

Your agent uses this to determine cyclohexane volumes based on production targets.

02 — Emissions Modeling

Your AI client uses this to predict N₂O output and test abatement performance.

03 — Oxidation Estimation

Your agent uses this to find chemical requirements for specific oxidation stages.

04 — Efficiency Optimization

Your AI client uses this to analyze the impact of recycling unreacted components.

One Click on Vinkius — From Prompt to Execution

Available at vinkius.com/en/ai-agent-connect/adipic-acid-plant-design-suite — connect your AI agent in three steps.

- 01 Connect your AI client to the Vinkius hosted MCP.
- 02 Input your production targets or chemical parameters into your AI chat.
- 03 The AI invokes the specific engineering tool needed for your request.
- 04 Receive precise calculations for feedstock, emissions, or efficiency.

You connect the MCP to your preferred AI client and start running engineering queries immediately.

Built For

This MCP is built for professionals working in industrial chemical manufacturing and environmental engineering.

Chemical Engineer

You hand off stoichiometry and process optimization tasks to the AI.

Environmental Compliance Officer

You use the AI to model emissions and ensure they stay within regulatory limits.

Plant Design Engineer

You use the AI to calculate feedstock and recycling loop efficiencies during the design phase.

What Changes When You Connect

- 01 Reduces manual calculation errors in feedstock and oxidation modeling.
- 02 Connects environmental impact predictions directly to production targets.

- 03** Provides rapid feedback on how recycling loops affect plant efficiency.
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Real-World Applications

Production Scaling

Calculate the exact cyclohexane needed when moving from pilot to full-scale production.

Regulatory Compliance

Model N₂O emissions to ensure your abatement systems meet EPA or other regional standards.

Process Optimization

Test how different recycling rates for unreacted components change your total plant output.

Feedstock Planning

Determine chemical requirements for specific oxidation stages in the production chain.

Patterns to Avoid

Guessing feedstock volumes

❌ AVOID

You try to estimate cyclohexane needs by looking at last month's spreadsheets and adding a 10% buffer.

✓ INSTEAD

Use `calculate_feedstock_requirements` to get the exact amount needed for your specific production target.

Ignoring abatement efficiency

❌ AVOID

You assume your N₂O scrubbers will always hit their target and ignore the impact of varying feed rates.

✓ INSTEAD

Run `calculate_environmental_impact` to see how your abatement system actually performs under different conditions.

Manual recycling math

❌ AVOID

You manually calculate how much unreacted material to loop back into the system to save on costs.

✓ INSTEAD

Let the MCP handle the complexity by using `optimize_recycling_loop` to see how recycling changes your total plant efficiency.

The Right Fit

Chemical engineers and environmental officers designing Nylon 6,6 processes should connect this MCP. If you are working in a different chemical sector or don't need to model N₂O emissions, skip it. The decision comes down to whether your workflow requires specific adipic acid stoichiometry and abatement modeling.

Adipic Acid Plant Design Suite 4 Tools

These tools handle the stoichiometry, feedstock math, and environmental modeling required for Nylon 6,6 production.

#	TOOL	DESCRIPTION
01	calculate_environmental_impact	This tool predicts nitrogen oxide emissions and evaluates the effectiveness of your abatement systems.
02	calculate_feedstock_requirements	Use this to find the exact amount of cyclohexane required to reach a specific production goal.
03	estimate_oxidation_parameters	This tool calculates the specific chemical requirements needed for various oxidation stages.
04	optimize_recycling_loop	This tool evaluates how recycling unreacted components changes your total plant efficiency.

See It in Action

Real prompts you can use once this MCP is connected to your AI agent through Vinkius Cloud.

U How much cyclohexane is required for 50,000 metric tons of adipic acid at 95% efficiency?



To produce 50,000 metric tons at 95% efficiency, you will need approximately 52,631.58 metric tons of cyclohexane.

U What are the N₂O emissions for 10,000 tons of adipic acid with 80% abatement efficiency under USA_EPA standards?



The total N₂O produced is 10,000 metric tons. After 80% abatement, the released amount is 2,000 metric tons, which complies with USA_EPA standards.

U Calculate the oxidation stages for 500 units of KA oil with 30% nitric acid concentration.



Processing 500 units of KA oil with 30% nitric acid concentration will require 3 discrete oxidation stages.

Frequently Asked Questions

01 What kind of AI clients can I use with this MCP?

You can use any MCP-compatible client, including Claude, Cursor, Windsurf, and VS Code.

02 Does this MCP handle environmental compliance?

Yes, it includes tools to predict N₂O emissions and evaluate the impact of abatement systems.

03 Can I use this for Nylon 6,6 production design?

Yes, the tool is specifically designed to support the production of Nylon 6,6 by balancing kinetics and compliance.

04 Do I need to host the MCP myself?

No, Vinkius hosts and manages the MCP for you. You just connect your client and start working.

05 Can it calculate cyclohexane needs?

Yes, the `calculate_feedstock_requirements` tool determines the amount of cyclohexane needed for specific production targets.

06 How do I calculate the amount of cyclohexane needed?

You can use the `calculate_feedstock_requirements` tool by providing your target annual production capacity and the expected conversion efficiency.

07 Can this tool help with environmental compliance?

Yes, the `calculate_environmental_impact` tool predicts N2O emissions and checks if they meet standards like USA_EPA or EU_IED.

08 How can I reduce nitric acid costs?

Use the `optimize_recycling_loop` tool to evaluate how recovering unreacted nitric acid affects your net requirements and overall efficiency.

Go Live in 60 Seconds

Get your connection token from cloud.vinkius.com, then paste the endpoint URL into any MCP-compatible client.

YOUR MCP ENDPOINT

https://edge.vinkius.com/[TOKEN]/mcp

CLIENT	WHERE TO CONFIGURE
 Claude AI	Profile → Customize → Connectors → "+" → Add custom connector → Paste endpoint
 Cursor	Settings → Features → MCP Servers → "+ Add New MCP Server" → Type: SSE → Paste endpoint
 VS Code	Ctrl/Cmd+Shift+P → "MCP: Add Server" → add <code>"adipic-acid-plant-design-suite": { "url": "..." }</code>
 Windsurf	MCP Settings → <code>mcp_settings.json</code> → Add endpoint URL
 ChatGPT	Settings → Tools & plugins → Add MCP server → Paste endpoint
 Gemini	Extensions → Add MCP Server → Paste endpoint URL

ASK AN AI ABOUT THIS

Let your preferred AI explain this MCP server

Ask ChatGPT

Ask Claude

Ask Perplexity

Ask Gemini

Ask Grok

READY TO CONNECT

Adipic Acid Plant Design Suite is live on Vinkius Cloud.

Get your connection token, paste it into your AI agent, and
start building. No SDK. No deployment. Just results.

Start at cloud.vinkius.com →

vinkius.com · support@vinkius.com

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DOCUMENT INFORMATION

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Endpoint	<code>https://edge.vinkius.com/{token}/mcp</code>

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