

High-Purity Alkaloid Foundation for Advanced Formulation & Synthesis

A technical briefing on the physicochemical versatility, reaction compatibility, and direct-compression tableting performance of uncomplexed, counter-ion-free Mitragynine (75–85% MIT | 90–95% Total Alkaloids).

THE STRATEGIC CHEMISTRY OF UNCOMPLEXED FREEBASE

In pharmaceutical manufacturing and advanced botanical formulation, **Mitragynine Freebase** provides the uncompromised starting point for finished-dose engineering. By eliminating stoichiometric counter-ions (such as fumarate, acetate, or citrate), the tertiary indole alkaloid is isolated in its purest, unhindered state. This zero-counter-ion architecture delivers **100% active chemical payload**—giving research chemists and formulators unmatched flexibility to selectively synthesize customized salts, execute downstream chemical derivatization, or compress cleanly into solid-dose tablets without introducing acidic micro-environments.

1. Bespoke Salt Engineering & Synthesis

Modular Synthetic Precursor

The ultimate starting material for formulators seeking proprietary IP or custom pharmacokinetic tuning through precision counter-ion pairing and reaction chemistry.

- ✓ **Stoichiometric Freedom:** Devoid of pre-existing conjugate acids, allowing formulators to pair the base with novel, target counter-ions (e.g., citrate, malate, tartrate, besylate) to dial in exact gastric solubility.
- ✓ **Derivatization Platform:** Uncomplexed chassis is immediately ready for clean oxidative transformations (e.g., bioconversion to 7-OH-mitragynine or novel derivatives) without salt stripping or counter-ion interference.
- ✓ **Maximized Active Payload:** 75–85% MIT (90–95% Total Alkaloids) eliminates 20–40% dead counter-ion weight, maximizing potency in low-volume reactors.

2. Direct Solid-Dose & Non-Aqueous Delivery

Direct Compression & Permeability Asset

Engineered as a clean, dry-milled crystalline solid that blends reliably into direct-compression tablet presses, capsules, sublingual lozenges, and lipid matrices.

- ✓ **Direct Tableting Compatibility:** Exhibits outstanding dry-powder compaction and plastic deformation when combined with standard direct-compression (DC) binder systems.
- ✓ **Zero Acid Core Microenvironment:** Eliminates intrinsic acidity from organic conjugate acids, significantly extending excipient shelf-life and preventing tablet discoloration.
- ✓ **Lipophilic Delivery Systems:** Uncharged neutral state provides superior compatibility with lipidic softgels, sublingual absorption matrices, and solvent-based suspensions.

COMPARATIVE TECHNICAL SPECIFICATIONS

PROPERTY	MITRAGYNE FREEBASE (OBX STANDARD)	PRE-FORMED MITRAGYNE SALTS (E.G. FUMARATE / ACETATE)
Alkaloid Purity	75.0% – 85.0% Mitragynine (90.0% – 95.0% Total Alkaloids)	Reduced active payload due to counter-ion mass (typically 52%–70% MIT)
Counter-Ion Class	None (Pure Uncomplexed Free Base)	Stoichiometric Dicarboxylic or Monocarboxylic organic acid
Isolation Chemistry	Proprietary 100% Aqueous-Based Method	Standard organic solvent precipitation & crystallization
Residual Solvents	Zero Residual Solvents (Non-detect for heptane, IPA, acetone, or alkanes)	Requires thermal/vacuum drying to satisfy USP residual solvent limits
Physical Form	Dry-milled, free-flowing crystalline powder; light cream to off-white	Anhydrous to semi-crystalline powder; off-white to beige
Chemical Versatility	Maximum: Directly reacts with any acid; synthetic precursor; softgels & DC tablets	Locked counter-ion pairing; requires stoichiometric displacement for repurposing
Excipient Compatibility	Broad / Neutral: Will not acidify tablet core; zero acid-catalyzed degradation	May react with acid-sensitive colorants, disintegrants, or alkaline binders
Solubility & Delivery	Lipophilic solvents, oil matrices, gastric-dissolving tablets, bespoke salt solutions	Predetermined aqueous release profile (rapid or sustained gastric curve)

Proprietary Aqueous Processing & Solid-Dose Compression Guidelines:

Zero Residual Solvent Assurance: Unlike typical botanical isolates that rely on hydrocarbon extractions, Chemesis utilizes a **proprietary 100% aqueous-based isolation method** to yield Mitragynine Freebase. As a direct result, the final material contains **zero residual solvents (non-detect for heptane, isopropanol [IPA], or volatile organic solvents)**, providing an exceptionally pure, food- and pharmaceutical-grade safety profile for clean-label formulation or reaction scaling.

Direct Compression Parameters: Supplied as a free-flowing, dry-milled crystalline solid optimized for direct compression (DC) tableting without wet granulation. For high-speed rotary press operations, our team recommends **60%–75% Microcrystalline Cellulose (MCC PH-102 or Silicified MCC)**, **0.75%–1.25% Sodium Stearyl Fumarate (SSF)** or Magnesium Stearate lubricant, and **0.25%–0.5% Colloidal Silicon Dioxide (Aerosil)** to maximize hopper flowability and prevent punch face adhesion.