# MK-677

CAS: 159752-10-0
Formula: C28H40N4O8S2

**Document ID:** b102c827
**Revision Date:** 2026-08-07
**Version:** 1.0

## Section 1 — Product and Company Identification

| | |
|---|---|
| **Product Name** | MK-677 |
| **Synonyms** | Ibutamoren mesylate; 159752-10-0; MK-677 |
| **CAS Number** | 159752-10-0 |
| **Molecular Formula** | C28H40N4O8S2 |
| **IUPAC Name** | 2-amino-2-methyl-N-[(2R)-1-(1-methylsulfonylspiro [2H-indole-3,4'-piperidine]-1'-yl)-1-oxo-3-phenylmethoxypropan-2-yl]propanamide; methanesulfonic acid |
| **Identified Uses** | Research laboratory chemical for in vitro scientific research and development use only. |
| **Restriction on Use** | Not for human or veterinary use. Not for food, drug, cosmetic, household, agricultural, clinical, therapeutic, or diagnostic applications. |

### Manufacturer / Supplier

| | |
|---|---|
| **Company** | Ruo.bio |
| **Address** | 30 N Gould St, Sheridan, WY 82801, US |
| **Phone** | +1-804-636-6879 |
| **Website** | https://ruo.bio/ |
| **Emergency Phone** | +1(804)636-6879 - Monday-Friday: 9:00 AM - 5:00 PM Pacific |

## Section 2 — Hazard Identification

### Classification of the substance

Not classified based on currently available data; however, data is limited and hazards cannot be fully characterized. The absence of classification should not be interpreted as a determination of the absence of hazard.

*Classification has been conducted in accordance with 29 CFR 1910.1200 (OSHA HazCom 2012) and GHS Rev.8 using all available data and scientifically valid weight-of-evidence approaches (GHS Rev.8 Chapter 1.3.2.4), including read-across from chemical class and structural considerations where substance-specific study data is not available.*

**Signal Word: None**

**GHS Pictograms:**
None required based on classification.

**Hazard Statements**
None. This substance is not classified for any GHS hazard class based on available data.

**Precautionary Statements**

- P261: Avoid breathing dust, fume, gas, mist, vapors, or spray.
- P264: Wash hands and exposed skin thoroughly after handling.
- P280: Wear protective gloves, protective clothing, and eye/face protection.
- P501: Dispose of contents and container in accordance with local, regional, national, and international regulations.

*Precautionary statements are provided as best practice for handling substances with limited toxicological data, and are not a declaration of GHS classification.*

**Hazards Not Otherwise Classified (HNOC)**
None known based on available data and weight-of-evidence assessment. The toxicological properties of this substance have not been fully characterized; handle as a potentially bioactive substance of unknown toxicity.

## Section 3 — Composition / Information on Ingredients

Single-substance product. Chemical identity:

| Ingredient | CAS Number | Mol. Formula | Mol. Weight | Concentration |
|---|---|---|---|---|
| MK-677 | 159752-10-0 | C28H40N4O8S2 | 624.8 g/mol | >98% (research grade) |

**Impurities**
No hazardous impurities known to be present above the GHS classification thresholds specified in 29 CFR 1910.1200 Appendix A. Residual synthesis reagents, solvents, and counter-ions may be present at levels consistent with research-grade (>98% purity) material. Balance: non-hazardous impurities. Refer to the accompanying Certificate of Analysis (CoA) for the lot-specific impurity profile.

## Section 4 — First Aid Measures

**Eye Contact**
Rinse cautiously with water for several minutes. If irritation persists, seek medical advice.

**Skin Contact**
Wash with soap and water. Remove contaminated clothing and wash before reuse. If irritation persists, seek medical advice.

**Inhalation**
Move affected person to fresh air. If symptoms develop, seek medical advice.

**Ingestion**
Rinse mouth thoroughly with water. If large amounts are swallowed or if symptoms develop, seek medical advice. Do not induce vomiting unless directed by medical personnel.

**Note to Physician**
Treat symptomatically. No specific antidote known.

## Section 5 — Fire Fighting Measures

**Flash Point:** *Not determined*

**Suitable Extinguishing Media**
Use extinguishing media appropriate to the surrounding fire conditions. Carbon dioxide (CO2), dry chemical powder, foam, or water spray.

**Special Hazards**
May produce toxic gases upon combustion. Carbon monoxide and other combustion products may be generated.

**Protective Equipment for Firefighters**
Wear self-contained breathing apparatus (SCBA) and full protective gear. Do not enter fire area without proper protective equipment.

## Section 6 — Accidental Release Measures

**Personal Precautions**
Avoid dust formation. Avoid breathing vapors, mist, or gas. Ensure adequate ventilation. Evacuate personnel to safe areas. Use personal protective equipment as described in Section 8.

**Environmental Precautions**
Prevent further leakage or spillage if safe to do so. Do not allow the product to enter drains, sewers, or waterways.

**Containment and Cleanup**
Sweep up and shovel. Keep in suitable, closed containers for disposal. Avoid raising dust. Clean contaminated surface thoroughly. Dispose of waste in accordance with local regulations (see Section 13).

## Section 7 — Handling and Storage

**Handling Precautions**
Avoid contact with eyes, skin, and clothing. Avoid breathing dust, fumes, mist, vapors, or spray. Keep container tightly closed. Use with adequate ventilation. Wash thoroughly after handling. For research use only.

**Storage Conditions**
Store in a cool, dry, well-ventilated area away from incompatible materials. Keep container tightly closed. Store at room temperature unless otherwise specified.

**Incompatibilities**
Strong oxidizing agents, strong acids, strong bases.

## Section 8 — Exposure Controls / Personal Protection

**Exposure Limits**
No regulatory occupational exposure limits (OEL) have been established by OSHA, ACGIH, NIOSH, or equivalent bodies for MK-677 (ibutamoren mesylate; CAS 159752-10-0). No biological exposure indices (BEIs) have been

established. Control exposure to the lowest level reasonably achievable (ALARA) using the engineering controls and PPE specified below. Handle as a potentially bioactive substance of unknown toxicity.

**Engineering Controls**

Use in a well-ventilated area under local exhaust ventilation (LEV) such as a certified chemical fume hood, ventilated weighing enclosure, or Class I/II biosafety cabinet whenever the material is manipulated as a dry powder or aerosol--generating operation is performed. For weighing, dispensing, or dissolution of the neat solid, a glove box or ventilated balance enclosure is preferred to minimize inhalation exposure. Follow the hierarchy of controls described in OSHA's Hazardous Drugs guidance (29 CFR 1910.1200; OSHA Technical Manual) and NIOSH Publication 2004-165 principles for handling drugs of unknown occupational hazard. Provide readily accessible emergency eyewash and safety shower stations in the work area (ANSI Z358.1). Do not eat, drink, smoke, or store food in areas where this substance is handled. Wash hands and exposed skin thoroughly after handling and before breaks.

**Personal Protective Equipment**

**Respiratory Protection:** Respiratory protection is not normally required when handling small quantities under adequate local exhaust ventilation. If engineering controls are insufficient, if airborne dust, mist, or aerosol may be generated, or if handling as a bulk powder outside containment, use a NIOSH-approved (42 CFR Part 84) air-purifying respirator with N100/P100 particulate filters, or a powered air-purifying respirator (PAPR) with HEPA cartridges for higher exposure potential. Respirator selection, fit-testing, and use must comply with the OSHA Respiratory Protection Standard (29 CFR 1910.134).

**Hand Protection:** Wear chemically resistant, impervious protective gloves compliant with EN ISO 374 / ASTM F739. Nitrile rubber gloves of at least 0.11 mm thickness are generally suitable for incidental contact; double-gloving is recommended when handling the neat solid or concentrated solutions, consistent with USP <800> practice for handling hazardous drugs of unknown toxicity. Inspect gloves before use, replace immediately if torn, punctured, or contaminated, and remove using a technique that avoids skin contact with the outer surface. Wash hands with soap and water after removal.

**Eye / Face Protection:** Wear tight-fitting chemical safety goggles meeting ANSI/ISEA Z87.1 (US) or EN 166 (EU) when handling this substance. A full-face shield worn over goggles is recommended when there is a risk of splashing, spraying, or dust generation. Do not wear contact lenses when handling this material.

**Skin Protection:** Wear a chemically resistant laboratory coat or coverall closed at the neck and wrists, with sleeves fully covering the forearms. For operations with higher exposure potential (bulk powder handling, weighing, dissolution), wear a disposable chemical-resistant gown with impermeable back, closed-front, and long sleeves with knit cuffs (as recommended by USP <800> for hazardous drugs). Use closed-toe, chemical-resistant footwear; add disposable shoe covers where powder contamination is possible. Remove and launder or dispose of contaminated clothing before reuse; do not take contaminated clothing home.

## Section 9 — Physical and Chemical Properties

| | |
|---|---|
| **Physical State** | Solid (research-grade lyophilised powder or crystalline solid) |
| **Appearance** | White to off-white solid |
| **Odor** | Odorless |
| **Odor Threshold** | Not available. |
| **Boiling Point** | *Not determined* |
| **Melting Point** | *Not determined* |
| **Flash Point** | *Not determined* |
| **Auto-ignition Temperature** | No data available. |
| **Decomposition Temperature** | No experimental data available. |

| | |
|---|---|
| **Vapor Pressure** | *Not determined* |
| **Vapor Density** | *Not determined* |
| **Specific Gravity** | *Not determined* |
| **Partition Coefficient (log Kow)** | No experimental data available. |
| **Solubility** | Soluble in DMSO (~50 mg/mL); sparingly soluble in water (mesylate salt, approximately 1 mg/mL); the free base is practically insoluble in water. |
| **Stability in Solution** | Subject to hydrolytic and oxidative degradation typical of the chemical class; store reconstituted solutions refrigerated or frozen, protect from light, and use within the stability window indicated on the Certificate of Analysis. |
| **pH** | *Not determined* |
| **Molecular Weight** | 624.8 g/mol |
| **Molecular Formula** | C28H40N4O8S2 |

## Section 10 — Stability and Reactivity

**Chemical Stability:** Stable under normal conditions of use, storage, and transport.

**Conditions to Avoid:** Excessive heat, open flames, sparks, incompatible materials.

**Incompatible Materials:** Strong oxidizing agents, strong acids, strong bases.

**Hazardous Decomposition Products:** Upon combustion or decomposition may produce: carbon monoxide (CO), carbon dioxide (CO2), nitrogen oxides (NOx), sulfur oxides (SOx).

**Hazardous Polymerization:** Will not occur.

## Section 11 — Toxicological Information

*The toxicological properties of this substance have not been fully characterized. Where no authoritative study data was identified, endpoint classifications are based on a weight-of-evidence approach using read-across from the compound's chemical class and structural features, per GHS Rev.8 Chapter 1.3.2.4. “Not classified” entries below mean “not classified based on currently available data” — hazards cannot be excluded.*

**Acute Toxicity:** No reliable acute toxicity data (LD50/LC50) for MK-677 (Ibutamoren mesylate, CAS 159752-10-0) from authoritative sources such as ECHA, NIOSH, or peer-reviewed literature have been identified. The substance is not listed on the OSHA-regulated substances table or in the NIOSH RTECS registry with quantitative acute toxicity values. Not classified based on currently available data; hazards cannot be excluded, and the toxicological properties of this substance are not fully characterized. Treat as potentially harmful if swallowed, inhaled, or absorbed through skin.

**Skin Corrosion / Irritation:** No experimental skin corrosion or irritation studies for MK-677 conducted under OECD Test Guideline 404 or equivalent have been located in ECHA dossiers, PubChem, or the peer-reviewed literature. Not classified based on currently available data; hazards cannot be excluded. The mesylate salt form contains methanesulfonic acid counter-ion, and dusts or solutions may be mechanically or chemically irritating to skin on prolonged contact. Skin contact should be avoided.

**Serious Eye Damage / Irritation:** No experimental eye irritation or serious eye damage data (OECD Test Guideline 405 or equivalent) for MK-677 have been identified in authoritative databases (ECHA, PubChem, peer-reviewed literature). Not classified based on currently available data; hazards cannot be excluded. Particulates of the solid substance may cause mechanical irritation to the eye; contact with eyes should be avoided.

**Skin / Respiratory Sensitization:** No skin or respiratory sensitization studies (e.g., OECD Test Guidelines 406, 429, 442) for MK-677 have been located in ECHA registration dossiers, PubChem, or peer-reviewed literature. Not classified based on currently available data; sensitization hazards cannot be excluded, and the sensitization potential of this substance is not fully characterized.

**Germ Cell Mutagenicity / Genotoxicity:** Not classified based on currently available data; hazards cannot be excluded. Weight-of-evidence assessment applied using read-across from chemical class and structural considerations (GHS Rev.8 Chapter 1.3.2.4); no authoritative substance-specific study data identified.

**Carcinogenicity:** MK-677 (CAS 159752-10-0) is not listed in the IARC Monographs on the Evaluation of Carcinogenic Risks to Humans, the U.S. National Toxicology Program (NTP) Report on Carcinogens, the OSHA regulated carcinogen list (29 CFR 1910 Subpart Z), or the ACGIH TLV carcinogen classifications. Not classified based on currently available data; carcinogenic hazards cannot be excluded, and the carcinogenic potential of this substance is not fully characterized.

**Reproductive Toxicity:** No reproductive or developmental toxicity studies (e.g., OECD Test Guidelines 414, 416, 421, 422, 443) for MK-677 have been identified in ECHA dossiers or the peer-reviewed literature indexed in PubMed/-PubChem. The substance is not listed under California Proposition 65 for reproductive toxicity. Not classified based on currently available data; reproductive and developmental hazards cannot be excluded. As a precaution, exposure of pregnant or nursing individuals and those of reproductive capacity should be minimized.

**Specific Target Organ Toxicity (STOT):** Specific Target Organ Toxicity - Single Exposure (STOT-SE): No studies establishing STOT-SE classification for MK-677 under GHS criteria have been located in authoritative sources (ECHA, NIOSH, peer-reviewed literature). Not classified based on currently available data; hazards cannot be excluded. Specific Target Organ Toxicity - Repeated Exposure (STOT-RE): No repeated-dose toxicity studies (e.g., OECD Test Guidelines 407, 408, 410, 413) meeting GHS Category 1 or 2 thresholds have been identified in authoritative databases. Not classified based on currently available data; hazards from repeated or prolonged exposure cannot be excluded, and target-organ effects of this substance are not fully characterized. Repeated or prolonged occupational exposure should be avoided.

**Aspiration Hazard:** Not classified based on currently available data; hazards cannot be excluded. Weight-of-evidence assessment applied using read-across from chemical class and structural considerations (GHS Rev.8 Chapter 1.3.2.4); no authoritative substance-specific study data identified.

**Derived No-Effect Level (DNEL):** No data available — no substance-specific DNEL has been derived.

**Predicted No-Effect Concentration (PNEC):** No data available — no substance-specific PNEC has been derived.

## Section 12 — Ecological Information

*No authoritative substance-specific ecotoxicity study data was identified. In the absence of experimental data, adverse environmental effects cannot be fully excluded.*

**Ecotoxicity:** No substance-specific experimental aquatic or terrestrial toxicity data (e.g., fish LC50, Daphnia EC50, algal ErC50) have been identified for MK-677 (ibutamoren mesylate; CAS 159752-10-0) in authoritative databases including PubChem (CID 6450830), U.S. EPA ECOTOX, or ECHA registered substance dossiers. Not classified as hazardous to the aquatic environment (acute or chronic) based on a weight-of-evidence assessment in the absence of authoritative experimental data. As a pharmacologically active growth hormone secretagogue, release to the environment should nevertheless be avoided; prevent entry into surface water, groundwater, drains, and sewers.

**Persistence and Degradability:** No substance-specific experimental data on ready biodegradability (e.g., OECD 301 series), hydrolysis (OECD 111), or phototransformation have been identified for this substance in authoritative sources. Environmental persistence has not been experimentally established. The molecule contains a sulfonamide, a benzyl ether, and an amide linkage together with a methanesulfonate counterion; no validated (Q)SAR or regulatory persistence classification from ECHA, EPA, or peer-reviewed literature has been located for this specific compound.

**Bioaccumulative Potential:** No experimentally determined octanol/water partition coefficient (log Kow), bioconcentration factor (BCF), or bioaccumulation study results from authoritative sources (PubChem, ECHA, U.S. EPA) have been identified for MK-677 (CAS 159752-10-0). Bioaccumulation potential cannot be reliably characterized in the absence of substance-specific experimental data.

**Mobility in Soil:** No substance-specific experimental data identified.

**Other Adverse Effects:** No other adverse environmental effects identified. The substance is not included on the Montreal Protocol list of ozone-depleting substances.

## Section 13 — Disposal Considerations

Dispose of contents and container in accordance with all local, state, and federal regulations. Do not dispose of this material into sewers or waterways. Contact a licensed waste disposal company for disposal guidance.

**US:** Dispose in accordance with 40 CFR Parts 261-270 (RCRA). **EU:** Dispose according to Directive 2008/98/EC (Waste Framework Directive).

## Section 14 — Transport Information

| | |
|---|---|
| **DOT (US)** | Not regulated as dangerous goods under DOT (49 CFR) based on current classification. |
| **IATA** | Not regulated as dangerous goods under IATA Dangerous Goods Regulations based on current classification. |
| **IMDG** | Not regulated as dangerous goods or as a marine pollutant under the IMDG Code based on current classification. |
| **UN Number** | Not applicable. |

*Transport classifications above are based on the substance's intrinsic hazard classification; the shipper must independently verify the classification, packaging, labelling, and documentation requirements for their specific shipment configuration, quantity, and carrier (including airline policies) prior to dispatch.*

## Section 15 — Regulatory Information

### United States

**TSCA (Toxic Substances Control Act):** May be eligible for exemption from TSCA inventory listing requirements under the R&D provisions of 40 CFR 720.36, depending on actual conditions of use. This substance is supplied solely for use in scientific research and development in small quantities; it is not intended for, and shall not be used for, any commercial manufacturing, processing, or distribution in commerce. The importer/end user is responsible for confirming that the R&D exemption criteria are met for their specific use. **OSHA HazCom 2012:** This SDS was prepared in accordance with 29 CFR 1910.1200 (HazCom 2012), aligned with the Globally Harmonized System (GHS) Rev. 8. **CERCLA / SARA Title III:** Not listed as a CERCLA Hazardous Substance (40 CFR 302.4); not subject to SARA 313 reporting based on available classification data. Users must independently verify applicability for their facility.

### European Union

**REACH (EC 1907/2006):** Supplied solely for Scientific Research and Development (SR&D) use in quantities below 1 tonne per year per legal entity. Where applicable, this use may be exempt from REACH registration obligations under the scientific research and development provisions of REACH Article 3(23) and the conditions of Article 26(3);

importers/users should independently verify the applicable exemption pathway for their specific use. If the substance is used as part of a formally notified Product and Process Oriented Research and Development (PPORD) programme, the separate notification procedure under REACH Article 9 (with a 5-year exemption renewable once) may apply instead. **CLP (EC 1272/2008):** Not classified under CLP based on available data; no harmonized classification entry identified in Annex VI of CLP or the ECHA Classification and Labelling (C&L) Inventory.

### Canada

**WHMIS 2015 / HPR:** Not classified as a hazardous product under the Hazardous Products Act and Hazardous Products Regulations (SOR/2015-17) based on available data and weight-of-evidence assessment. Supplied for laboratory research use only. **DSL/NDSL:** Research-use exemption applies; substance is not intended for commercial import or manufacture in Canada.

*Note: The regulatory statements above reflect the intended use of this substance for scientific research and development only and do not constitute a legal determination of regulatory status. If the substance is used outside the R&D exemption scope, users are solely responsible for independently verifying applicable regulatory obligations (TSCA, REACH, WHMIS, state, and local) for their specific use and jurisdiction prior to any such use.*

## Section 16 — Other Information

| | |
|---|---|
| **Document ID** | b102c827-813a-4396-990d-a9b81711e11c |
| **Revision Date** | 2026-08-07 |
| **Version** | 1.0 |
| **Prepared By** | Prepared in accordance with GHS Rev.8 and OSHA HazCom 2012 (29 CFR 1910.1200). Independent review by a qualified chemical safety professional is recommended prior to use. |

### Revision History

**Revision date:** 2026-08-07
**Version:** 1.0
**Change description:** Initial issue. Document prepared in 16-section GHS Rev.8 / OSHA HazCom 2012 format.

### Sources Used

- PubChem (U.S. National Library of Medicine / NCBI) — https://pubchem.ncbi.nlm.nih.gov
- Peer-reviewed chemistry and toxicology literature (class-based read-across and weight-of-evidence assessment per GHS Rev.8 Chapter 1.3.2.4)
- OSHA HazCom 2012 / 29 CFR 1910.1200 Appendix A–C; GHS Rev.8; OECD Test Guidelines

### Key to Abbreviations

CAS = Chemical Abstracts Service; GHS = Globally Harmonized System of Classification and Labelling of Chemicals; OSHA = U.S. Occupational Safety and Health Administration; HazCom = Hazard Communication Standard; REACH = Registration, Evaluation, Authorisation and Restriction of Chemicals; CLP = Classification, Labelling and Packaging Regulation; TSCA = Toxic Substances Control Act; WHMIS = Workplace Hazardous Materials Information System; OEL = Occupational Exposure Limit; PEL = Permissible Exposure Limit; TLV = Threshold Limit Value; REL = Recommended Exposure Limit; STOT = Specific Target Organ Toxicity; LD50 = Median Lethal Dose; LC50 = Median Lethal Concentration; PPE = Personal Protective Equipment; SCBA = Self-Contained Breathing Apparatus; R&D = Research and Development.

### Disclaimer

*DISCLAIMER: The information in this Safety Data Sheet is compiled from the authoritative sources cited above, supplemented by weight-of-evidence assessment based on the compound's chemical class and published literature. It*

*is believed to be accurate as of the revision date but is provided "as is" without warranty of any kind, express or implied, including fitness for a particular purpose. The preparer of this document has not independently tested the substance described herein. Users bear sole responsibility for verifying all information, ensuring safe handling, and compliance with all applicable federal, state, provincial, and local regulations. This SDS is not a substitute for independent chemical safety assessment by a qualified professional. This product is intended for scientific research and development use only and is not for human consumption, drug, food, cosmetic, agricultural, or household use.*

This SDS complies with GHS Revision 8 / UN GHS Rev.8 and OSHA HazCom 2012 (29 CFR 1910.1200).