

Example of research paper on chemical: streptozotocin

[Business](#), [Management](#)



Chemical Abstract Number: 242-646-8

Common Uses Streptozotocin

The chemical Streptozotocin (STZ) is identified to be useful for the treatment of “metastasizing pancreatic islet cell tumors, malignant carcinoid tumors, and as an

investigational drug for diabetes research” (Virginia Commonwealth University ñ Office of Environmental Health & Safety, 2009, p. 1).

A determination if your chemical is a carcinogen, reproductive toxicant and/or highly toxic chemical.

The chemical is classified as possible carcinogen and mutagen . It was clearly identified as “‘reasonably anticipated to be a human carcinogen’ based on sufficient evidence of carcinogenicity in experimental animals (IARC, 1978, 1982)” (cited in . As a carcinogen, the chemical is found to have strong potentials for causing cancer or tumor in various parts of the body. In addition, since the chemical is included among NIOSH list of drugs categorized as hazardous confirms STZ as such.

Target organ(s)

In the report prepared by the BC Cancer Agency, the institution reported that the potential side effects to identified organ sites are summarized in the table on the next page. The organ sites that were identified included blood, bone marrow, skin, stomach, pancreas, and renal or genitourinary organ . The adverse side effects were noted to be possible through significant exposure to STZ, as described in greater detail in the following summarized format.

Source: BC Cancer Agency, 2007

A determination if chemical is a solvent, pesticide, metal, radionuclide and/or other.

The description of the chemical indicates that it is highly soluble in water, “ ketones, and lower alcohols and only slightly soluble in polar organic solvents (NTP, 2005)” (cited in Virginia Commonwealth University: Office of Environmental Health & Safety, 2009, p. 1). Likewise, aside from the potential serious effects noted in terms of carcinogenicity, STZ is reported to cause occupational exposure hazards including cytotoxicity or genotoxicity, teratogenicity, and reproductive toxicity (Virginia Commonwealth University: Office of Environmental Health & Safety, 2009).

Absorption – distribution – elimination.

In terms of potential effects on humans, STZ was noted to have potential short-term irritation to the skin when accidentally contacted. The known clinical effects include the following: “ adverse effects most commonly reported in clinical use include nausea, vomiting. Kidney dysfunction has been seen during clinical use. Effects on blood and blood-forming organs have also occurred” .

In addition, information regarding pharmacokinetics including data on oral absorption, metabolism, and excretion are summarized in the table below:

Source: BC Cancer Agency, 2007, p. 1

A description of biotransformation/metabolism major pathway(s) and toxic metabolites or transition molecules.

A description of metabolic effects to major pathways where STZ have been adversely administered are noted herewith: “ mild to moderate abnormalities of glucose tolerance have been noted in some patients treated with ZANOSAR (streptozocin) . These have generally been reversible, but insulin shock with hypoglycemia has been observed” . In addition, the table presented in the previous page indicated information regarding STZ “ spontaneously degrades to methylcarbonium ions, extensively metalolized, likely in the liver and kidneys” .

Likewise, the data on parenteral administration of STZ which traces the chemical’s pathways are summarized in the table below:

Source: BC Cancer Agency, 2007, p. 4

Important Information about Streptozotocin

The chemical STZ is among the list of drugs categorized as hazardous with specifically categorized AHFS Pharmacologic-therapeutic classification as “ 10: 00 Antineoplastic agents” . The chemical’s manufacturer, Cayman Chemical Company prepared a Safety Data Sheet which contains relevant information pertaining to hazards identification, information on the ingredients, first aid measures, firefighting measures, accidental release measures, handling and storage, and engineering controls and use of personal protection, among others. From the report, the data that is required to inform individuals or workers who could be potentially exposed to the chemical are available in the most comprehensible manner.

Likewise, the common trade name for the chemical is ZANOSAR® . Another relevant information that was revealed indicates that “ primary routes of

occupational exposure to STZ include: inhalation, ingestion, accidental injection, and dermal absorption” . From the data on parenteral administration of STZ, it could be deduced that accidental injection could occur due to lack of appropriate knowledge and information on the proper administration for STZ. As noted, both subcutaneous and intramuscular routes of injection are not at all advisable or possible due to the corrosive nature of STZ.

References

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