

**Standard Operating Procedure and Checklist of Minimal Requisite Facilities for utilization of hazardous waste under Rule 9 of the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016**

**Utilization of Spent Sodium Acetate [generated from manufacturing of pharma product - 7-ACCA] in recovery of Sodium Acetate Tri-hydrate**



**November, 2024**

**Central Pollution Control Board  
(Ministry of Environment, Forest & Climate Change,  
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**Procedure for grant of authorization by State Pollution Control Boards (SPCBs)/Pollution Control Committees (PCCs) for utilization of Hazardous waste**

- 1) While granting authorization for utilization of hazardous wastes, SPCBs/PCCs shall ensure that authorization is given only to those wastes for which Standard Operating Procedures (SoPs) for utilisation have been circulated by Central Pollution Control Board (CPCB) ensuring the following:
  - a. The waste (intended for utilization) belongs to same source of generation as specified in SoP.
  - b. The utilization shall be same to as described in SoP.
  - c. End-use/ product produced from the waste shall be same as specified in SoP.
  - d. Authorization shall be granted only after verification of details and minimum requisite facilities as given in SoP.
  - e. Issuance of passbooks (similar to passbooks issued for recycling of used oil, waste oil, non-ferrous scraps, etc.) for maintaining records of receipt of hazardous waste for utilization.
  - f. Monitor closely the quantity of hazardous waste (Spent Sodium Acetate) being sent by generators and the quantity being utilized as per these SOPs by the authorized facilities, under HOWM Rules, 2016, to manufacture the product (sodium acetate tri-hydrate).
- 2) After issuance of authorization, SPCBs/PCCs shall verify the compliance of checklist and SoP on quarterly basis for initial 1 years; followed by random checks during subsequent period for atleast once a year. The compliance reports may be submitted to CPCB.
- 3) In-case of lack of requisite infrastructures with the SPCBs/PCCs, they may engage 3<sup>rd</sup> party institutions or laboratories having EPA, 1986/NABL/ISO17025 accreditation/ recognition for monitoring and analysis of prescribed parameters in SoPs for verification purpose.
- 4) SPCBs/PCCs shall provide half yearly updated list of units permitted under Rule 9 of Hazardous & Other Wastes (Management & Transboundary Movement) Rules, 2016 (HOWM Rules, 2016) to CPCB and also upload the same on SPCB/PCC website, periodically. Such updated list shall be sent to CPCB.
- 5) Authorization for utilisation shall not be given to the units located in the State/Union Territory where there is no Common TSDF, unless the unit ensures authorised captive disposal of the hazardous waste (generated during utilisation) or its complete utilisation or arrangement of sharing with any other authorised disposal facility.
- 6) In case of the utilization proposal is not same with respect to source of generation or utilization process or end-use as outlined in this SoP, the same may be referred to CPCB for clarification /conducting trial utilization studies and developing SoP thereof.
- 7) The source and work zone standards suggested in the SoP are based on E(P)A notified and OSHA standard respectively. However, SPCBs/PCCs may impose more stringent standards based on the location or process specific conditions.
- 8) SPCBs/PCCs shall ensure that the utilizer of spent sodium acetate shall maintain daily records in National Hazardous Waste Tracking System (NHWTS).

### 107.0 Utilization of Spent Sodium Acetate:

Type of HW	Source of generation	Recovery/Product
Spent Sodium Acetate (Category: 28.1 of Schedule I of HOWM Rules, 2016)	Generated from manufacturing of Pharmaceutical product - 7-ACCA	Sodium Acetate Tri-hydrate for ultimate utilization in Dye & Dye Intermediate, Textile and Dyeing-Printing industries

### 107.1 Source of Waste:

Spent Sodium Acetate generated from manufacturing of Pharmaceutical product 7-ACCA, is categorized as hazardous waste at S. No. 28.1 of Schedule I of HOWM Rules, 2016, which is required to be disposed in authorized disposal facility in accordance with authorization condition, when not utilized as resource for recovery.

**Table 1. Typical Characteristics of Spent Sodium Acetate:**

S. no.	Parameter	Unit	Results
1	Appearance	-	Light Brownish
2	pH	-	8.69
3	Purity (Sodium Acetate)	%	62.8
4	TOC	mg/l	175345
5	COD	mg/l	524288
6	Chloride	mg/l	1914
7	Sulphate	mg/l	10656
8	Nitrate	mg/l	8.4
9	Iron as Fe	mg/l	19.6
10	Heavy metals (Hg, Cu, Cd, Pb, Ni, As, Cr)	mg/l	<0.001
11	CN	mg/l	<0.001

Note: SPCBs/PCCs to check the characteristics of spent sodium acetate prior to issuance of authorization, any significant deviation with respect to typical values mentioned in the table above may be examined with respect to the source or may be referred to CPCB.

### 107.2 Utilization Process

The manufacturing of sodium acetate tri-hydrate involves dissolving spent solid sodium acetate in water. A cationic surfactant is then added to aid in separating impurities such as chlorides and sulfates which form as floating materials which are removed through mechanical skimmers and the solution is then filtrated via nutch and sparkler filters and the residues disposed of at a TSDF. The purified solution undergoes crystallization. The crystallized sodium acetate tri-hydrate is centrifuged to isolate the final product, while the mother liquor is recycled back.

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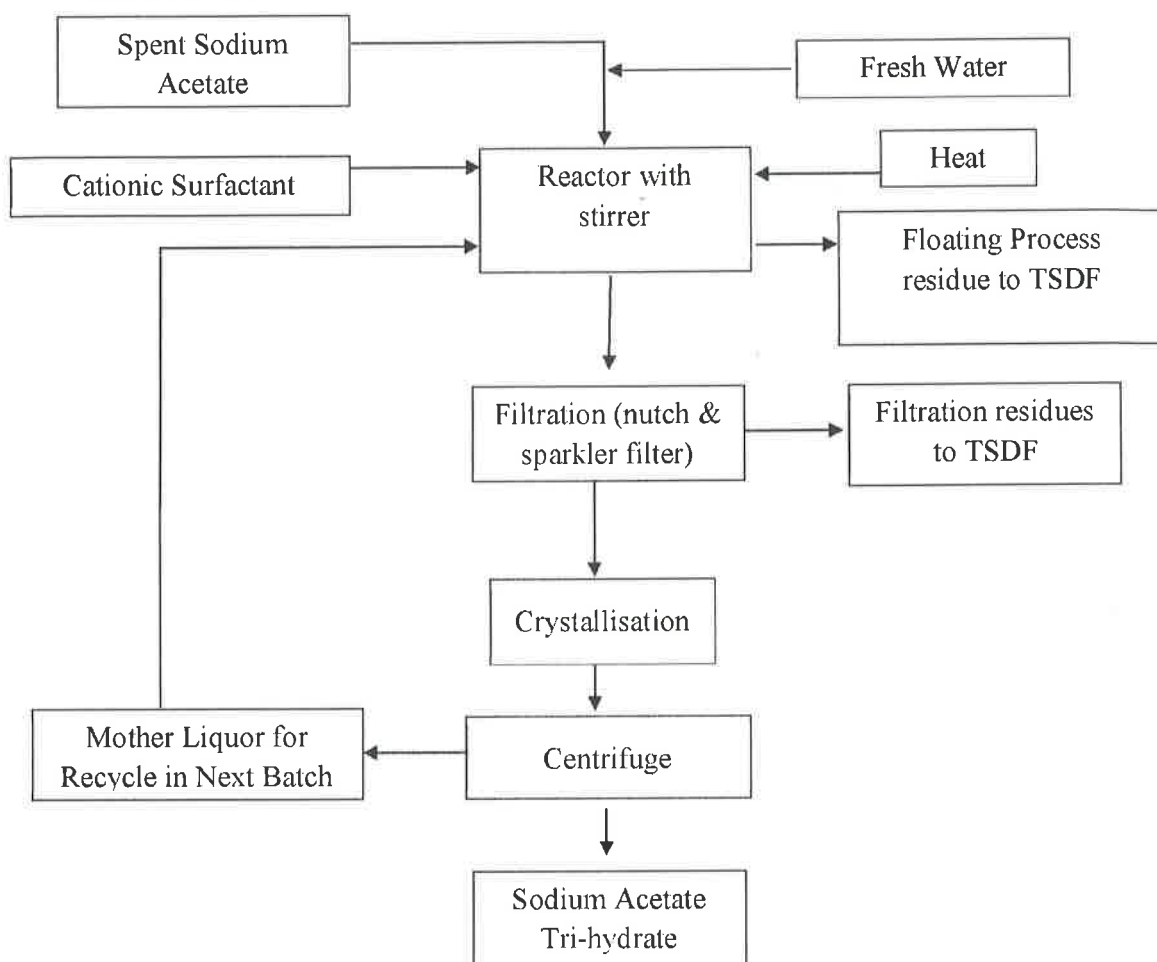


Figure: 1-Process flow diagram for utilization of spent sodium acetate

### 107.3 Standard Operating Procedures for utilization

This SOP is applicable only for utilization of Spent Sodium Acetate [generated from manufacturing of Pharmaceutical product -7-ACCA] in recovery of Sodium Acetate Tri-hydrate.

- 1) The solid Spent Sodium Acetate shall be procured in leakproof HDPE bags or HDPE drums only in SPCB/PCC authorized closed/ covered trucks/ vehicles fitted with requisite safeguards.
- 2) The Spent Sodium Acetate shall be stored in dedicated storage area with impervious/concreted floor under covered storage shed within premises.
- 3) The unloading and transfer of solid Spent Sodium Acetate shall be carried out by mechanical means as much as possible using equipment such as covered conveyor belt to hopper based feeding system, etc. The waste shall be received and handled in dedicated hazardous waste storage area. There shall be minimal manual handling during collection and transfer to reactor.
- 4) The entire process area shall have leak proof floor tiles with adequate slope to collect spillages, if any, into a collection pit. The spillage from reactors, pumps, if any to be collected in collection pit and may be transferred to ETP/CETP or reaction tank, as the case may be.

- 5) The removal of floating impurities from the reactor shall be carried out through mechanized system (such as skimmer) and filter system.
- 6) Unit shall provide complete closed system from reactor to filtration.
- 7) Treatment and disposal of wastewater:

Waste water generated from floor-washings, spillages, reactor washing, mother liquor etc. shall be treated utilized back in the process or Physico-Chemically in an ETP so as to comply with inlet standards prescribed in case of CETP or be treated in captive ETP having adequate treatment facilities to comply with surface water discharge standards as stipulated in the Consent issued by the SPCBs/PCCs.

In case of zero discharge condition, the treated waste water from ETP may be managed as per conditions stipulated by the SPCB/PCC.

Excess mother liquor if any shall be sent to TSDF for treatment and disposal or shall be treated in suitable ETP and the residues be sent to TSDF.
- 8) The treated effluent shall be discharged in accordance with the conditions stipulated in the Consent to Operate issued by concerned SPCB/PCC under the Water (Prevention and Control of Pollution) Act, 1974
- 9) The hazardous wastes generated (process residues from filters and skimmers) shall be collected and temporarily stored in non-reactive drums/ bags under a dedicated hazardous waste storage area and be sent to authorized common TSDF or other authorized facility within 90 days from its generation of the waste in accordance with the authorization issued by the concerned SPCB/PCC. Such storage area shall be covered with proper ventilation.
- 10) It shall be ensured that the Spent Sodium Acetate is procured from the industries, which have valid authorization from the concerned SPCB/PCC as required under HOWM Rules, 2016.
- 11) Transportation of Spent Sodium Acetate shall be carried out by sender (generator) or receiver only after obtaining authorization from the concerned SPCB/PCC under HOWM Rules, 2016. Requisite manifest document shall be followed as laid down under the said Rules.
- 12) Prior to utilization of Spent Sodium Acetate, the unit shall obtain authorization for storage, utilization and disposal of Spent Sodium Acetate from the concerned SPCB/PCC under HOWM Rules, 2016.
- 13) The unit shall maintain proper ventilation in the work zone and process areas. All personnel involved in the plant operation shall wear proper personal protective equipment (PPE) specific to the process operations involved and type of chemicals handled as per Material Safety Data Sheet (MSDS). The safety precautions of the worker shall be in accordance with the Factory Act, 1948, as amended from time to time.
- 14) In case of environmental damages arising due to improper handling of hazardous wastes including accidental spillage during generation, storage, processing, transportation and disposal, the occupier (sender or receiver, as the case may be) shall be liable to implement immediate response measures, environmental site assessment and remediation of



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contaminated soil/ groundwater/ sediment etc. as per the "Guidelines on Implementing Liabilities for Environmental Damages due to Handling & Disposal of Hazardous Wastes and Penalty" published by CPCB.

- 15) The unit shall provide suitable fire safety arrangements and flame proof electrical fittings.
- 16) During the process of utilization and handling of hazardous waste the unit shall comply with requirement in accordance with the Public Liability Insurance Act, 1991 as amended, wherever applicable.

#### **107.4 Product Usage / Utilization**

1. The recovered product i.e. Sodium Acetate Tri-hydrate shall be further permitted for Industrial uses only (such as Buffer solution in dyes and dyes intermediates, textile, dyeing and printing work). The recovered product shall be restricted for use in food, pharmaceutical and fertilizer sectors.
2. The unit shall label the product as "manufactured by utilizing hazardous waste" such as "This Sodium Acetate Tri-hydrate is manufactured utilizing spent sodium acetate generated from pharmaceutical industry".

#### **107.5 Record>Returns Filing**

- 1) The unit shall maintain a passbook issued by concern SPCB/PCC and maintain details of each procurement of Spent Sodium Acetate as mentioned below:
  - Address of the sender
  - Date of dispatch
  - Quantity procured
  - Seal and signature of the sender
  - Date of Receipt in the premises
- 2) A logbook with information on source and date of procurement of Spent Sodium Acetate, date wise utilization of the same, hazardous waste generation and its disposal, etc. shall be maintained including analysis report of fugitive emission monitoring & effluent discharged as applicable.
- 3) The unit shall maintain record of hazardous waste generated, utilized and disposed as per Form-3 & also file annual return in Form-4 as per Rule 20(1) and (2) of HOWM Rules, 2016, to concerned SPCB/PCC.
- 4) The unit shall submit quarterly and annual information on hazardous wastes consumed, its source, products generated or resources conserved (specifying the details like, type and quantity of resources conserved) to the concerned SPCB/PCC.
- 5) The unit shall use NHWTS to manage the manifest, enter daily records of quantity generated, disposed, etc.

#### **107.6 Standards**

- 1) Fugitive emission in the work zone area shall comply with the following standards:

<b>Parameter</b>	<b>Limit</b>
PM <sub>10</sub>	5 mg/m <sup>3</sup> , *TWA
Acetic Acid	25 mg/m <sup>3</sup> , *TWA

\*time-weighted average (TWA)- measured over a period of 8 hours of operation of process.



- 2) Monitoring of the fugitive emission shall be carried out quarterly for first year followed by at least annually in the subsequent year of utilization. The monitoring shall be carried out by ISO 17025 accredited or EPA, 1986 approved laboratories and the results shall be submitted to the concerned SPCB/PCC on a quarterly basis.
- 3) There shall be No Discharge in terms of industrial effluent as the Mother liquor generated shall be completely reused in the manufacturing process and the unit shall strictly adhere to 'Zero Liquid Discharge'.

#### 107.7 Siting of Industry

Facilities for utilization of Spent Sodium Acetate shall be preferably located in a notified industrial area or industrial park/estate/cluster and in accordance with Consent to Establish issued by the concerned SPCB/PCC.

#### 107.8 Size of Plant and efficiency of utilization

01 MT of Spent Sodium Acetate is utilized for manufacturing 0.95 MT of Sodium Acetate Tri-hydrate.

Therefore, requisite facilities of adequate size of storage shed and other plant and machineries shall be installed accordingly.

#### 107.9 Checklist of Minimal Requisite Facilities]

Sr. No.	Particulars
1.	Cool, dry well-ventilated covered storage shed(s) of adequate capacity to store Spent Sodium Acetate
2.	Adequate covered storage area with shed and impervious flooring, having proper slope and collection pit shall be provided.
3.	The unloading and transfer of solid Spent Sodium Acetate shall be carried out in a closed mechanized systems such as covered conveyor belt and hopper based feeding etc.
4.	Closed Reactor with agitator & heating arrangement
5.	Mechanised system for removal of floating material and filtration equipment for removal of floating residue.
6.	Separation of impurities by using Nutch filter followed by candle filter or any such effective filtration system.
7.	Crystallization unit
8.	Centrifuges.

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