

Jitin Talwar

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FER Response – Application No. 2362/DEL/2009

June 11, 2015

To
THE CONTROLLER OF PATENTS & DESIGNS
THE PATENT OFFICE
NEW DELHI

Re: **Kind Attention: Dr. Hardev karar (Deputy Controller of Patents & Designs)**
SUB: First Examination Report – Reply
REF: - Application No. 2362/DEL/2009
Name of the Applicant: - Vardhman Chemtech Ltd.
FINAL DATE OF EXPIRY: AUGUST 9, 2015
(12 MONTHS FROM THE DATE OF FIRST EXAMINATION REPORT)

Respected Sir,

In response to the first examination report on August 9, 2014, we hereby submit our reply along with the official letter (returned herewith) and the application and documents duly amended (wherever required) to meet the objections raised.

1. **As regards paragraph 1 (First objection) raised in the Examination report , we submit as follows:**

Claims 1, 2 and 3 have been rejected according to Section 2 (1) (j) of The Patents Act in view of document

D1: US4142059A hereinafter referred to as "D1"

D2: EP0632005A1 hereinafter referred to as "D2"

Applicants traverse this ground of rejection on the following grounds:

- As cited by the respected examiner, **US4142059A** hereinafter referred to as **D1**, titled "*Spray drying sodium and potassium 2-ethylhexanoate*" discloses a method of preparation of purified non-tacky crystalline sodium or potassium 2-ethylhexanoate. The process comprises spray drying an aqueous solution of sodium 2-ethylhexanoate or potassium 2-ethylhexanoate in a spray dryer having a temperature range of about 60° C. to about 160° C. to provide the corresponding sodium or potassium 2-ethylhexanoate having a moisture content of from

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about 0.5 to about 5.0 percent by weight. The following are the differences with the applicant's invention:-

- a) According to the method described by D1 **drying of aqueous solution of sodium 2-ethylhexanoate or potassium 2-ethylhexanoate is solely done by using spray drier** whereas process described in the **present application utilizes the heat generated during the reaction itself for primary drying**. This reduces overall energy consumption considerably.
 - b) **The sodium 2-ethylhexanoate obtained according to the process disclosed in D1 contained 3.57 percent by weight of water** as determined by Karl-Fischer analysis whereas the **moisture content of final product according to present application was found to be below 2% (around 1.5%)**.
 - c) D1 discloses that the **yield of the solid sodium or potassium 2-ethylhexanoate ranges from about 70 to about 97 percent** whereas according to present application the **yield of final product Sodium 2-ethylhexanoate is 98 percent**.
 - d) Lastly, it is respectfully submitted that in D1, **The process involves use of spray drier for drying the prepared salt which makes process costly and requires skilled personnel for operating the instruments** whereas the present application **there is no use of costly equipments like spray drier so overall process is cheap**. Equipments involved in the process are very simple that reduces the overall capital requirement and skill involved in the process. Therefore, this process can be easily used in remote and less developed areas.
- As cited by the respected examiner, EP0632005A1 hereinafter referred to as D2, titled "*Production of metal salts*" describes the production of substantially anhydrous potassium 2-ethyl hexanoate salt or its hydrate as a liquid phase.. The following are the differences with the applicant's invention:-
 - a) **Final product according to the process disclosed in D2 is the salt or hydrate as a liquid phase whereas present application describes that the final product is dry solid with moisture content of 1.5-2%**
 - b) According to the process discussed in D2 the **primary drying is done by conventional distillation at atmospheric pressure, usually with agitation, at up to about 350°C**. Preferably the temperature employed is in the range of 100°C to 350°C, more preferably 100°C to 250°C whereas according to the present application **the primary drying is done using the heat generated during the reaction itself**. It significantly reduces the energy and equipment requirement for the process.

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- c) Process according to D2 uses non-aqueous solvents like isopropanol or ethyl acetate to dissolve the liquid phase obtained after primary drying whereas process according to present invention do not use any non-aqueous solvent. Use of non-aqueous solvents further increases the overall cost and health hazards, which makes the process inconvenient for large scale production. Thus the process of present invention is more eco friendly.

From the foregoing discussion, it is submitted that both D1 and D2 do not teach the use of heat generated during the exothermic reaction of salt formation for drying purpose as recited in present claim 1 of the present application.

None of the citations (D1, and D2) gives the product having moisture content as low as recited in present claim 2 (1.5-2.0%).

Also, the process disclosed in D1 makes the preparation of final product costly as it utilizes sophisticated equipments & highly skilled personnel. D2 uses non-aqueous solvents for preparation of potassium 2-ethyl hexanoate. This makes the process hazardous, costly and non eco-friendly.

It is respectfully submitted that in view of the above, the objections mentioned may kindly be withdrawn and the present invention be allowed to overcome D1and D2.

Reconsideration of this ground of rejection and withdrawal thereof are respectfully requested.

2. As regards paragraph 2 raised in the Examination report , we submit as follows:

We have revised the claim 3 to meet the requirements.

3. As regards paragraph 3 raised in the Examination report , we submit as follows:

We hereby are submitting the abstract along with this response within the prescribed format.

4. As regards paragraph 4 raised in the Examination report , we submit as follows:

We hereby are submitting the Self Attested General Power of attorney with this response.

5. As regards paragraph 5 raised in the Examination report , we submit as follows:

We are submitting the revised Form 1 with this response.

6. As regards paragraph 6 raised in the Examination report , we submit as follows:

We are submitting the Form 3 with this response.

7. As regards paragraph 7 (Second objection) raised in the Examination report , we submit as follows:

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Since, there is no application have been filed in any patent office outside India , so there is no details under Section 8 (2) that is required to be submitted.

As all the requirements raised in the examination report have been complied with, we believe that the application is in order for acceptance and the acceptance of this application within the final period expiring on August 9, 2015 is respectfully requested. However, if the Examiner still believes that there is any further objection/requirement, the applicants request that an opportunity may be granted to officially hear the matter.

Very truly yours,



JITIN TALWAR
Advocate and Patent
Agent (IN/PA-1117)

Enclosures:

- Point by Points Remarks begin on page 1 of this response
- Revised Form 1
- Self Attested General Power of attorney
- Form 3
- Form 2 with complete specification
- Amended Claims
- Abstract

| | | | | |
|--|--------------------|--|---|------------------------|
| FORM 1 THE PATENTS ACT 1970 (39 OF 1970) & The Patents Rules, 2003 APPLICATION FOR GRANT OF PATENT (See section 7,54 & 135 and rule 20 (1)) | | (FOR OFFICE USE ONLY) Application No.: Filing Date: Amount of Fee Paid: CBR No.: Signature: | | |
| 1. APPLICANT | | | | |
| Name | | Nationality | Address | |
| VARDHMAN CHEMTECH LTD. | | IN | PLOT NO. 525, PHASE -II, INDUSTRIAL AREA , CHANDIGARH, INDIA. | |
| 2. INVENTOR (S) | | | | |
| Name | | Nationality | Address | |
| GUJRAL , Rajinder Singh | | IN | PLOT NO. 525, PHASE -II, INDUSTRIAL AREA , CHANDIGARH, INDIA. | |
| GUPTA, Vivek | | IN | PLOT NO. 525, PHASE -II, INDUSTRIAL AREA , CHANDIGARH, INDIA. | |
| 3. TITLE OF THE INVENTION | | | | |
| A NOVEL PROCESS FOR SYNTHESIS OF PURE SODIUM 2-ETHYL HEXANOATE SALT | | | | |
| 4. ADDRESS FOR CORRESPONDENCE OF APPLICANT / AUTHORIZED PATENT AGENT IN INDIA | | | Fax No. 02266459108 | |
| Mr. Jitin Talwar, Advocate and Patent Agent (India), Registration Number - IN/PA 1117, Talwar Advocates, 413-P, Sector 6 Panchkula-Haryana-134109 | | | Mobile No. +91-9876667711 | |
| | | | E-mail : prosecution@talwaradvocates.com | |
| 5. PRIORITY PARTICULARS OF THE APPLICATION (S) FILED IN CONVENTION COUNTRY | | | | |
| Country | Application Number | Filing Date | Name of the Applicant | Title of the Invention |
| NA | NA | NA | NA | NA |
| 6. PARTICULARS FOR FILING PATENT COOPERATION TREATY (PCT) NATIONAL PHASE | | | | |
| International application number: NA | | | International Filing Date: NA | |
| 9. DECLARATIONS : | | | | |
| (i) Declaration by the Inventor(s) | | | | |
| We, the above named inventor are the true & first inventors for this invention and declare that the applicant herein is our assignee. | | | | |
| (a) Date | | | | |
| (b) Signature (s) | | | | |
| (c) Name(s) GUJRAL , Rajinder Singh | | | | |
| (a) Date | | | | |
| (b) Signature (s) | | | | |
| (c) Name(s) GUPTA, Vivek | | | | |



I/We, the applicant(s) hereby declare(s) that:

- The Complete specification relating to the invention is filed with this application.
- I am/We are, in the possession of the above mentioned invention.
- There is no lawful ground of objection to the grant of the Patent to me/us.
- I am/We are, the assignee or legal representative to true first inventors


10. Following are the attachments with the application:

- (a) Provisional Specification, No. of **Pages** (Including the Form 2 Page), No. of Claims
- (b) Drawings, No. of sheets -
- (c) Statement and Undertaking Form 3 - **Pages**
- (d) Declaration as to Inventorship Form 5 – **Pages**

Date On Bank.

I/We hereby declare that to the best of my/our knowledge, information and belief the fact and matters stated herein are correct and I/We request that a patent may be granted to me/us for the said invention.

Dated this. November 17, 2009

Signature :- 

Name : **JITIN TALWAR**
Advocate and Patent Agent (IN/PA-1117)
Agent for the Applicant

To,

The Controller of Patents

The Patent Office, at Delhi



हरियाणा HARYANA

B 107596

FORM 26

THE PATENTS ACT, 1970
(39 of 1970)

&

THE PATENTS RULES, 2003

**FORM FOR AUTHORISATION OF A PATENT AGENT/OR ANY PERSON
IN A MATTER OR PROCEEDING UNDER THE ACT**

(Refer sections 127 and 132; rule 135)

We, VARDHMAN CHEMTECH LIMITED, SCO 350-352, SECTOR - 34 A CHANDIGARH, INDIA hereby authorize MR. JITIN TALWAR, ADVOCATE AND PATENT AGENT (INDIA) REGISTRATION NUMBER - IN/PA 1117 - 413-P, SECTOR 6 PANCHKULA-HARYANA-134109 (E-mail- talwar@ticonsultants.co.in) to act on our behalf for all patent matters including registration/renewal/restoration/assignment and all such other proceedings before the controller of patents or the Government of India and request that all notices, requisitions and communication relating thereto may be sent to such person at the above address unless otherwise specified.

We hereby revoke all previous authorization, if any made, in respect of same matter or proceeding.

We hereby assent to the action already taken by the said person in the above matter.

Dated this 28th day of May, 2010

Applicant

To
The Controller of Patents,
The Patent Office,
At New Delhi

Accepted
Jitin Talwar

Rajendra Singh Gujral
(Full Name) R S Gujral
(Designation) Director

True Copy

Jitin Talwar
JITIN TALWAR
ADVOCATE AND PATENT AGENT
IN/PA-1117
29/5/2010

Ji
(JITIN TALWAR)
Advocate and patent Agent
IN/PA-1117

FORM 3
THE PATENT ACT, 1970
(39 OF 1970)
&
The Patents Rules, 2003
STATEMENT AND UNDERTAKING UNDER SECTION 8
(See section 8, rule 12)

We, **VARDHMAN CHEMTECH LTD** hereby declare

(i) that We who have made this application No. **2362/DEL/2009** Dated **November 17, 2009**

alone, made for the same/substantially same invention, application(s) for patent in the other countries, the particulars of which are given below :

| Name of the country | Date of Application | Application No. | Status of the application | Date of publication | Date of grant |
|---------------------|---------------------|-----------------|---------------------------|---------------------|---------------|
| NA | NA | NA | NA | NA | NA |

(iii) that the rights in the application(s) have been assigned to **VARDHMAN CHEMTECH LTD** and that we undertake that up to the date of grant of the patent, by the Controller, We would keep him informed in writing the details regarding corresponding applications for patents filed outside India within six months from the date of filing of such application.

The applicant is pleased to provide the further details whenever asked or required.

Dated this June 11, 2015

Signature:



Name of Natural Person:

JITIN TALWAR
(Advocate and Patent Agent - IN/PA - 1117)

To,

The Controller of Patents

The Patent Office, Delhi

FORM 2
THE PATENTS ACT 1970
39 of 1970
&
The Patent Rules 2003
COMPLETE SPECIFICATION
(See sections 10 & rule 13)

1. TITLE OF THE INVENTION

A NOVEL PROCESS FOR SYNTHESIS OF PURE SODIUM 2-ETHYL
HEXANOATE SALT

2. APPLICANTS (S)

| NAME | NATIONALITY | ADDRESS |
|------------------------|-------------|--|
| VARDHMAN CHEMTECH LTD. | IN | Plot No. 525, Phase II - Industrial Area, Chandigarh. |

3. PREAMBLE TO THE DESCRIPTION

COMPLETE

The following specification particularly describes the invention and the manner in which
it is to be performed.



FIELD OF THE INVENTION

The present invention pertains to the field of chemical technology. More specifically it pertains to the preparation of a pure Sodium 2-ethylhexanoate salt useful as Chemical/Pharmaceutical intermediate, especially in the preparation of synthetic medicines.

BACKGROUND OF THE INVENTION

Sodium 2-ethylhexanoate (Fig. 1) belongs to category of API i.e. active pharmaceutical intermediates. It is a white to off white hygroscopic crystalline powder and highly soluble in water; having a molecular formula of $C_8H_{15}NaO_2$ and a molecular weight of 166.19.

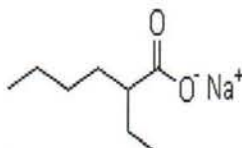


Fig. 1 Chemical Structure of Sodium 2-ethylhexanoate

15

Uses of Sodium 2-ethylhexanoate as chemical and pharmaceutical intermediate

Sodium 2-ethylhexanoate is a strong reducing agent; used as a **chemical intermediate** for the synthesis of metallic salts (for paint and varnish driers), polyester coating additives and esters (for plasticizers and stabilizers). It is also utilized as a mild acid scavenger which is useful in acylation of amines with acid chlorides as the base. It is highly soluble in common organic solvents such as methanol, ethanol, acetone, and the like, so it is used in the conversion of higher molecular weight organic acids to the corresponding salt of such acid by metathesis.

It is widely used as **pharmaceutical intermediate** in the preparation of sodium ampicillin, crystalline salts of amoxicillin which are useful for preparing potent

antibiotic solutions. It is also used as salifiable agent in semi-synthetic cephalosporin.

5 **Methods of preparation of Sodium 2-ethylhexanoate in prior art and their limitations**

It is important that Sodium 2-ethylhexanoate should be of a high purity and easy to handle for its effective utilization as a chemical and pharmaceutical intermediate. Various methods have been reported in the literature for preparation of such alkali metal salts but suffer from one limitation or the other which are
10 described as below:

Organic anti-solvent method

The preparation of Sodium 2-ethylhexanoate has been accomplished by **simply titrating** an aqueous solution of the alkanolic acid with the appropriate alkali
15 metal hydroxide and then adding to the aqueous solution a suitable **organic anti-solvent** in order to force the alkanolic acid salt out of solution and into a solid form.

Such process suffers from **various drawbacks** viz.

- 20
1. **High cost** due to the use of organic anti-solvents.
 2. **Safety hazards** resulting from working with large volumes of such solvents.
 3. **Poor quality** of the sodium 2-ethylhexanoate so formed which is impure, in the form of precipitated solid of undesirable crystalline characteristics,
25 hard to dry and generally difficult to manage especially on a commercial scale due to its extreme hygroscopic properties.

Spray drying method

Patent No. US4142059 discloses a process for preparing Sodium 2-ethylhexanoate having improved purity and crystalline character, in addition to
30 having improved handleability by **spray drying** method. In this patent, a solution

of sodium hydroxide in water was stirred and cooled in an ice-water bath to 20° C. The 2-ethylhexanoic acid was added drop wise to the reaction mixture over a time period of thirty minutes. The whole reaction temperature was maintained at or below 70° C by cooling in an ice water bath.

- 5 After stirring for one hour, the aqueous solution obtained was of 63.5 % by weight of Sodium 2-ethylhexanoate and was atomized through a spray nozzle into a spray drying apparatus (Spray drying typically is a process which involves the rapid dehydration of moist particles which contain solids in either the soluble or insoluble form or both) having an inlet air temperature of about 118° to about
10 138° C and the outlet temperature was recorded at about 107° C. Finally, the Sodium 2-ethylhexanoate was collected from the bottom of the spray dryer.

But the above patent suffers from **various drawbacks** viz.

- 15 1. **Special reaction conditions** such as high viscosity of the solution being atomized and operational temperature are required for achieving successful drying and formation of a crystalline product.
2. **High cost** of spray drying apparatus makes the method difficult to apply for routine processes especially when automated instrumentation is not available.

20

In contrast, the present invention has developed an easy, cost effective procedure which does not require any water bath to maintain the temperature of the reaction and costly apparatus for drying. A brief comparison of process of synthesis of Sodium 2-ethylhexanoate of the above patent in prior art and that of present
25 invention is given below in **Table 1**.

30

Table. 1 Comparison between prior art patent and present invention

| S.No | Steps used | Prior art patent (US4142059) | Present invention |
|------|---|---|--|
| 1. | Synthesis of Sodium 2-ethylhexanoate | <p>The synthesis of Sodium 2-ethylhexanoate is done by adding 2-ethylhexanoic acid drop wise to the solution of sodium hydroxide.</p> <ul style="list-style-type: none"> The whole reaction temperature was maintained at or below 70° C by cooling in an ice water bath. So it is more energy consuming. The aqueous solution obtained was of 63.5% by weight of Sodium 2-ethylhexanoate. | <p>The synthesis of Sodium 2-ethylhexanoate is done by adding solution of sodium hydroxide under constant stirring to 2-ethylhexanoic acid.</p> <ul style="list-style-type: none"> No water bath is used to maintain the temperature of the reaction below 70° C. So it is less energy consuming. The aqueous solution obtained was of 70% by weight of Sodium 2-ethyl hexanoate. |
| 2. | Drying method/Equipment requirement | <p>Spray drying method used</p> <ul style="list-style-type: none"> Skilled manpower required to operate the apparatus. Very costly. | <p>Pan drying method used</p> <ul style="list-style-type: none"> Skilled manpower not required to supervise the reaction. Highly cost effective. |
| 3. | Special reaction conditions during drying of Sodium 2-ethylhexanoate | It requires high viscosity of the solution being atomized and operational temperature during drying. | It is not required in the present process of the invention. |
| 4. | Moisture content | Sodium 2-ethylhexanoate which is thus formed is having a moisture content of 0.5-5.0% . | Sodium 2-ethylhexanoate is having a moisture content as desired even below 2.0% . |

Other processes for preparing the sodium salt of 2-ethylhexanoic acid include **freeze drying** an aqueous solution of such salt. However, this method is

commercially unfeasible since an aqueous solution containing about fifty percent by weight of Sodium 2-ethylhexanoate fails to remain frozen under normal freeze-drying conditions. **Simple tray-drying** of such aqueous solutions is commercially unfeasible due to the extreme length of time required to effect dehydration and
5 more importantly because such process fails to provide a product of acceptable crystalline quality.

Thus, in all the methods of synthesis reported in prior art, the major limitation was the requirement of special chemicals and equipments. Some processes in the prior
10 art require a very long time for the synthesis of Sodium 2-ethylhexanoate which is commercially unfeasible and they could not be performed when automated instrumentation is not available. Even Sodium 2-ethylhexanoate formed by such processes is of very poor quality. The process of the present invention has been able to overcome all these limitations as it permits the synthesis of pure Sodium 2-
15 ethylhexanoate at the commercial level by the use of easily available chemicals and equipments.

OBJECTS OF THE INVENTION

The invention has the following objects:

- 20 1. To disclose a novel process for synthesis of pure Sodium 2-ethylhexanoate which is less energy consuming, more cost effective, faster and easier than the processes existing in prior art.
- 25 2. To disclose a novel process for synthesis of pure Sodium 2-ethylhexanoate in which the equipment used for subsequent drying of aqueous solutions of Sodium 2-ethylhexanoate to get fine powdered form is readily available in most of the chemical and pharmaceutical industries.
- 30 3. To disclose a novel process for synthesis of pure Sodium 2-ethylhexanoate which does not require special reaction conditions during drying of aqueous solutions of Sodium 2-ethylhexanoate.

SUMMARY OF THE INVENTION

The invention relates to a novel process for synthesis of pure sodium 2-ethyl hexanoate using batch process which is less energy consuming, more cost effective, faster and easier. Here, subsequent drying of aqueous solutions of Sodium 2-ethylhexanoate is done in a pan to obtain purified sodium 2-ethylhexanoate in fine powdered form.

BRIEF DESCRIPTION OF THE DRAWINGS

NIL – No drawings attached.

DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to a novel process for synthesis of pure Sodium 2-ethyl hexanoate using batch process which can obviate the drawbacks of existing processes.

NOVELTY ASPECT OF THE INVENTION

The present invention describes a novel process for synthesis of pure Sodium 2-ethyl hexanoate which consume less energy, easy, faster and more cost-effective to obtain concentrated form of aqueous solutions of Sodium 2-ethylhexanoate.

INVENTIVE STEP

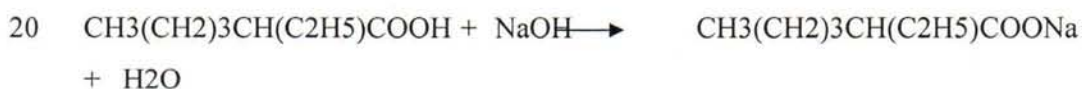
The inventive step of the present invention lies in obtaining concentrated form of aqueous solutions of Sodium 2-ethylhexanoate at the very first stage of production cycle wherein the heat generated during the reaction itself is used in dehydrating the aqueous solution of salt, thus significantly reducing energy and equipment requirements, drastically reducing the cost of production. Subsequent drying of this concentrated form is done in a pan to obtain purified Sodium 2-ethylhexanoate in fine powdered form which meets all the quality parameters of final product.

INDUSTRIAL APPLICATION

The present method is simple, fast, cost effective and efficient in obtaining pure Sodium 2-ethylhexanoate salt. The chemicals and equipments required for the synthesis of Sodium 2-ethylhexanoate are easily available commercially at low cost. The present process of invention does not require high energy consumption machinery like spray dryer and skilled manpower to supervise the reaction. Owing to all the above advantages, the present invention has a good industrial application for the chemical and pharmaceutical manufacturers as it allows the commercial scale production of Sodium 2-ethylhexanoate salt at the economical rate.

NOVEL PROCESS FOR THE SYNTHESIS OF PURE SODIUM 2-ETHYLHEXANOATE

In this batch processing method 950 kg of ethylhexanoic acid (Octoic acid) is charged in the reactor and aqueous solution of sodium hydroxide (caustic solution) is added continuously to the reactor under constant stirring till the desired pH of 7.2-7.6 is achieved. Here, caustic solution is made by dissolving 265 kg of sodium hydroxide in 275-300 liters of water and almost all solution is consumed during the reaction to achieve desired pH. The reaction is as follows:



2 EthylHexanoic Acid Sodium Hydroxide Sodium 2 Ethyl Hexanoate
water


Since the reaction between 2-ethylhexanoic acid and sodium hydroxide is exothermic in nature, most of the water content is evaporated by the use of heat generated during the reaction. The whole process occurs at atmospheric or reduced pressure and is completed in time duration of about 6-8 hrs.

When the mixture becomes concentrated, it is unloaded and transferred to open pan for drying with stirring in between, using suitable heating media like steam,

hot oil etc. The pH of solution, moisture content and clarity of the product solution is monitored all the time during the process of pan drying. Clarity of solution is 10.0% w/v in water and ethyl acetate in the present process of invention. As acidic pH is hazardous during pan drying so continuous monitoring
5 is required in between the process. When moisture content reaches below 2.0 % (about 1.5%), the material is unloaded, allowed to cool and results in formation of lumps of sodium 2-ethyl hexanoate salt. It is then subjected to operation of multi milling where it is grinded to obtain fine powdered form. Finally, the powdered material undergoes quality testing and yield is found to be about 98% and this
10 final product is packed in the containers and sealed. .

In the above detailed description of the invention, method of preparation of a pure Sodium 2-ethylhexanoate salt has been disclosed. It is to be understood that this invention is not limited to particular embodiments described as such and these
15 may of course vary. It is also to be understood that the terminology used herein is for the purpose of describing particular embodiments only and is not intended to be limiting, since the scope of the present invention will be limited only by the appended claims.

November 07, 2009


JITIN TALWAR
Advocate and patent Agent
W/PA-1117

WE CLAIM

1. A process for synthesis of pure Sodium 2-ethylhexanoate salt comprising of reaction between ethylhexanoic acid and aqueous solution of sodium hydroxide

5 - Wherein the dehydration of aqueous solutions of Sodium 2-ethylhexanoate salt is done by the exothermic heat generated during the reaction itself under controlled conditions of pH 7.2-7.6 and at atmospheric or reduced pressure.

10 - Wherein subsequent drying of this concentrated salt containing about 70% weight of Sodium 2-ethylhexanoate salt is done in an open pan at a product temperature below 150°C to obtain lumps of Sodium 2-ethylhexanoate salt which are powdered by multi milling operation.

15 2. The process for synthesis of pure Sodium 2-ethylhexanoate salt as claimed in claim 1 wherein concentrated Sodium 2-ethylhexanoate salt is pan dried to obtain moisture content as low as 1.5-2.0%.

20 3. A process for the synthesis of pure Sodium 2-ethylhexanoate salt as described herein with reference to the detailed description.

November 17, 2019



Jitin Talwar

Advocate and patent Agent (IN/PA-1117)

Agent for the Applicant


25

ABSTRACT

CANCELLED.

The present invention discloses a novel process for synthesis of pure Sodium 2-ethyl hexanoate which is simple, fast, cost effective, less energy consuming and more efficient. The same has been achieved by dehydrating the aqueous solution of salt and subsequent drying in a pan to obtain purified salt in fine powdered form meeting all the quality parameters of final product.

November 17, 2009


Dhin Palwar
Advocate and Patent Agent
IW/PA-1117

CLAIMS

WE CLAIM:

[Original Claims] 1. The process of synthesis of pure Sodium 2-ethylhexanoate salt comprising of reaction between ethylhexanoic acid and aqueous solution of sodium hydroxide.

- Wherein the dehydration of aqueous solution of Sodium 2-ethylhexanoate salt is done by the exothermic heat generated during the reaction itself under controlled conditions of PH 7.2-7.6 and at atmospheric and reduced pressure.

- Wherein subsequent drying of this concentrated salt containing about 70% of weight of sodium 2-ethylhexanoate salt is done in an open pan at a product temperature below 150°C to obtain lumps of Sodium 2-ethylhexanoate salt which are powdered by multi milling operation.

[Original Claims] 2. The process of synthesis of pure Sodium 2-ethylhexanoate salt as claimed in claim 1 wherein concentrated Sodium 2-ethylhexanoate salt is pan dried to obtain moisture content as low as 1.5 to 2.0%.

[Currently Amended] 3. The process for the synthesis of pure Sodium 2-ethylhexanoate salt characterized in the steps comprising:

- a) Reacting ethylhexanoic acid with an aqueous solution of sodium hydroxide maintaining the pH at 7.2-7.6 to obtain the Sodium 2-ethylhexanoate salt;
- b) Dehydrating the water present in reaction mixture by exothermic heat generated during the reaction in step(a) to get concentrated salt containing about 70% of weight of sodium 2-ethylhexanoate salt;

- c) Subsequent drying of the obtained sodium 2-ethylhexanoate concentrated salt in an open pan at a temperature below 150°C to obtain lumps of Sodium 2-ethylhexanoate salt with moisture content as low as 1.5 to 2.0%; and
- d) Multi-milling the lumps of sodium 2-ethylhexanoate salt to obtain pure powdered form of Sodium 2-ethylhexanoate salt.

November 17, 2019



Jitin Talwar

Advocate and patent Agent (IN/PA-1117)

Agent for the Applicant

ABSTRACT

The present invention discloses a novel process for synthesis of pure Sodium 2-ethyl hexanoate which is simple, fast, cost effective, less energy consuming and more efficient. The same has been achieved by dehydrating the aqueous solution of salt and subsequent drying in a pan to obtain purified salt in fine powdered form meeting all the quality parameters of final product.

10 **November 17, 2019**



Jitin Talwar

Advocate and patent Agent (IN/PA-1117)

Agent for the Applicant