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# Estimation of IsoAmyl-2-CyanoAcrylate Purity by Gas Chromatography

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## ABSTRACT

Isoamyl-2-cyanoacrylate is a non-toxic, bio-compatible, haemostatic and bacteria static monomeric component in nature. But in presence of moisture it gets converted into polymer. It is used as tissue Bio-adhesive; it is an alternative to suturing in medical and cosmetic surgeries. It is an inert material solidifies rapidly in alkaline media and slowly solidifies in acidic media within 5-10 seconds. It has a tendency of rapid wound closure with minimal scarring and reduces the subsequent infection. It is less traumatic and more efficient, precise and safe. It effectively replaces the conventional wound closure procedures. It is an active component in brand name "Amcrylate" is manufactured and promoted by" Concord drugs Limited" Hyderabad. The analytical gas chromatographic method is developed for the estimation of purity of isoamyl-2-cyanoacrylate, procedure as follows.

**Keywords:** Iso Amyl 2-CyanoAcrylate, Bio-Adhesive, Suture less Skin closure in Pediatric day-care surgery, Amcrylate Purity Analysis by Gas-Chromatography.

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# INTRODUCTION

Iso amyl 2-Cyanoacrylate is used as Tissue Bio adhesive [1]. It is an active component in Brand "Amcrylate" which is manufactured and promoted in India by CONCORD DRUGS LIMITED, Hyderabad. It is used as alternative to suturing [2] in medical surgeries and cosmetic surgeries. It is a non-toxic, biocompatible, haemostatic, and bacteria static. Actually it is monomer in nature, but when it comes into contact with moisture it gets converted into polymer. It is an inert material and solidifies less than 5-10 seconds. It is having a character, which solidifies rapidly in alkaline media, and slowly solidifies in acid media. It does not get absorbed into the blood stream. It is bacteria free and is unaffected by many other bacteria.

It has a tendency of rapid wound closure [3,4] with minimal scarring. And risk of subsequent infection is reduced. It is less traumatic and more efficient, precise and safe. It effectively replaces conventional wound closure procedures. It is supplied in ampoule containing Isoamyl 2-cyanoacrylate 0.25ml/05ml/1ml.

**Structure of Isoamyl 2-cyanoacrylate**

**Storage:**

Store and protect it from light, freezing and excessive heat.

**Chemical Names:**

Isoamyl 2-cyanoacrylate; 2-Propenoic acid, 2-cyano- 3-methylbutyl ester; 3-methylbutyl 2-cyanoprop-2-enoate; Iso pentyl 2-cyanoacrylate.

**Molecular Formula:** $C_9H_{13}NO_2$

**Material requirement:**

**1.** Gas chromatographic instrument with FID (flame ionization detector).

2. Column: HP.5; 30m×0.32mm×0.25µ or equivalent .3.Carrier gas: Helium

**Chromatographic Method:**

**Programme:**

**Oven Temperature: 150º** C 5º C/min 250 º C (10min)

**Carrier Gas Pressure:** 10.20 Psi

**Split Ratio:** 1:10

**Injector Temperature:** 230 º C

**Detector Temperature:** 250 º C

**Injection Volume:** 2µl

**Hydrogen gas:** 40ml/min

**Air:** 400ml/min

**Make up flow:** 25ml/min

**Preparation of Standard Solution:**

Exactly weigh 130 mg working standard of Isoamyl-2-cyanoacrylate and transfer it into 10 ml Standard volumetric flask and dissolved in little amount of Methylene Dichloride (Purity 99%) and makeup with the same, up to the mark.

**Preparation of sample solution:**

Exactly take the Sample of Isoamyl-2-cyanoacrylate equivalent to 130 mg and transferred into 10 ml standard volumetric flask dissolved in little amount of Methylene Dichloride (Purity99%) and makeup with the same, up to the mark.

Set the above parameters in GC (Gas Chromatography) instrument make/model; AGILENT /7890-A, Software EZ-Chrome.

We can observe the peak at retention time at 3.649 min. Areas of the eluted Standard and Sample peaks are 41442359, 41483843 respectively. Purity can be calculated by the following formula…

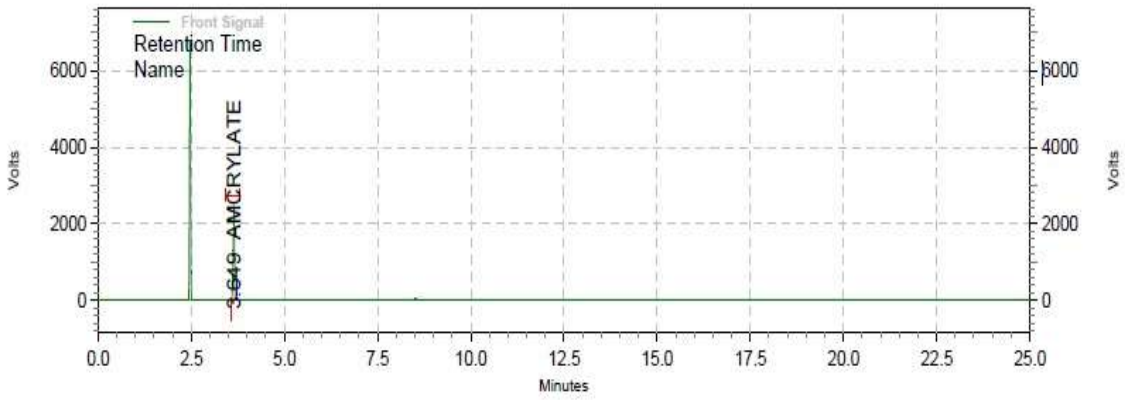
(Standard Area ÷ Sample Area)× (Sample weight ÷ Standard weight) × 100 = 99.89 %

## RESULTS AND DISCUSSION:

Equal ppm, standard and sample solutions generate approximately equal area .From that data calculation conforms that IsoAmyl-2-CyanoAcrylate sample purity is good (99.89%).

**Area % Report**

Data File: E:\2016\Result\05022016004.dat
Method: D:\Agilent\Nov 2016\Method\Amcrylate.met
Acquired: 1/16/2017 9:53:25 AM (GMT +05:30)
Printed: 2/27/2017 5:16:20 PM (GMT +05:30)




**Front Signal**
**Results**

| Retention Time | Area | Area % | Height | Height % |
|---|---|---|---|---|
| 3.649 | 41442359 | 100.00 | 18740989 | 100.00 |
| Totals | 41442359 | 100.00 | 18740989 | 100.00 |

## CONCLUSION:

Above chromatographic method (Gas chromatography) is suitable for the estimation of purity of IsoAmyl-2-CyanoAcrylate which is available in various commercial dosage forms in the medicinal field.

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