



Introduction

CEFAZOLIN is an antibiotic used to treat methicillin-susceptible *Staphylococcus aureus* infections. The usual dose is **6 g per day**. To the best of our knowledge, no stability data for cefazolin :

- 125 mg/mL (6 g in 48 mL) in syringes for continuous infusions
- 50 mg/mL (12 g in 240 mL) in elastomeric devices for infusions at home.

Objectives

Physicochemical stability studies of CEFAZOLIN solutions

Concentrations : 125 mg/mL (syringe) or 50 mg/mL (elastomeric)

Container: polypropylene syringes or elastomeric devices

Solvent: NaCl 0.9% - D5W

Storage : 20-25°C (syringe) or 37°C (elastomeric devices)

Analysis after preparation, and after 6, 24 and 48 hours.



Materials and Method

Chemical stability : defined as a concentration above 90% of the initial concentration

① RP-HPLC with DAD detector at 272 nm

- **Column:** C18 LiChrospher® 12.5 cm, 40 °C, particle size=5 µm
- **Mobile phase:** isocratic
80 % KH₂PO₄ buffer 0.005 M, pH=7.5 and 20 % of methanol
- **Flow rate** at 1.0 mL/min
- **Injector temperature** at 20°C
- **Injection volume:** 50 µL

Physical stability



- **Visual examination :** change of colour, precipitation, gaz formation

➔ 3 syringes and 3 elastomeric devices (FOLFUSOR®, Baxter) for each condition (S1 – S2 – S3)

② Validation of the method as recommended by ICH Q2(R1)

▪ Forced degradation

Acidic	Alkaline	Thermic	Photolysis
HCl 5 M 5 min	NaOH 0.1 M 10 min	80 °C 2 hours	20 min - under a sun-like spectrum lamp at 254 nm

- **Linearity :** standard curve with 5 points : 75-175 µg/mL
- **Repeatability and intermediate precision**

③ pH measurement (Bioblock Scientific pH meter)

- **Subvisual examination :** turbidimetry by spectrophotometry at 350, 410 and 550 nm (Safas Monaco UV m²)

Results

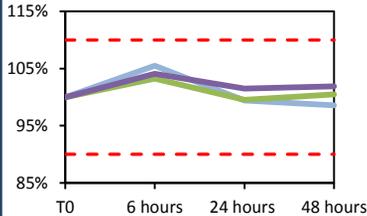
① Validation – RP-HPLC method

- **Linearity :** R² > 0.999
- **Repeatability :** [0.15-0.85%] - intermediate precision < 0.57%

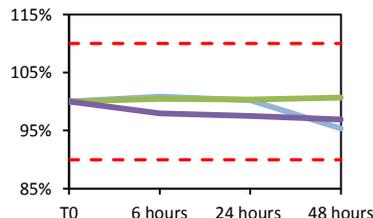
② Chemical stability –HPLC

125 mg/mL – syringe – 20-25°C

NaCl 0.9%

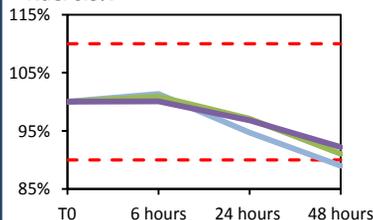


D5W

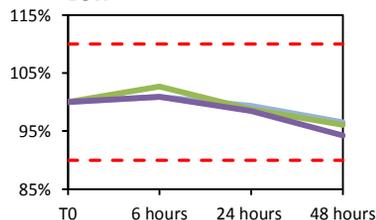


50 mg/mL – elastomeric – 37°C

NaCl 0.9%



D5W



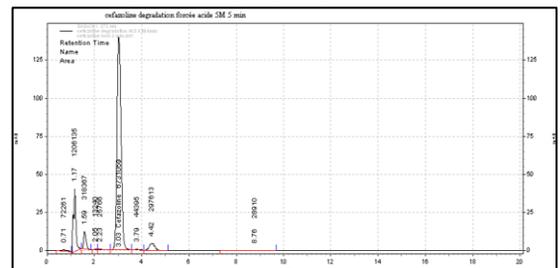
pH measurement

- **Syringes :** ↗ of one pH unit after 48 h
- **Elastomeric devices :** ↗ of one pH unit after 6 h

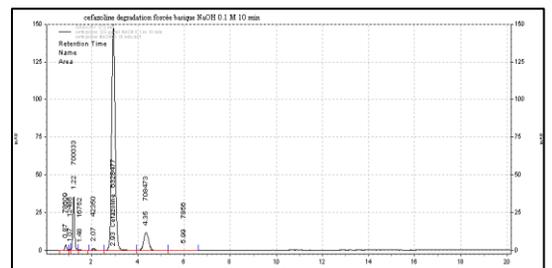
③ Physical stability

Visual aspect: no modification in elastomeric device and in syringe

▪ Stability indicating capacity



Chromatogram of CEFAZOLIN 125 µg/mL in NaCl 0.9% after acidic stressed conditions (HCl 5 M, 5 min)



Chromatogram of CEFAZOLIN 125 µg/mL after alkaline stressed conditions (NaOH 0.1 M, 10 min)

Subvisual aspect: ↗ of absorbances in elastomeric device and stable in syringe

Conclusion

Stability of cefazolin in **syringes**, diluted in NaCl 0.9% or in D5W at 125 mg/mL, for **24 hours at 20-25°C**.



Cefazolin in **elastomeric devices** at 50 mg/mL is **unstable** after 6 hours. These preparations are **not recommended**.

