



Global Approaches to Emergent Challenges

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Meet the World Pharmacopoeias Symposium | EDQM | 20th February 2020

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27-02-20

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What are Nitrosamines? Molecules of concern that are potential human carcinogens. Present in some foods, drinking water and e.g. cosmetic products

- · Nitrosamines form on reaction of an amine with a nitrosating source. The nitrosamine functional group is N-N=O
 - Also known as N-nitroso-compounds and N-nitrosamines
- The rate of reaction and stability of nitrosamines is governed by the other substituents on the amine
 - Nitrosamine can form over time in a product if it contains a nitrosatable and nitrosating source.

Nitrosamines formed from secondary amines are stable. These are the main area of focus in cosmetic products

$$\mathbf{R}^{\mathsf{N}}_{\mathsf{R}^{\mathsf{N}}} \; \rightarrow \; \mathbf{R}^{\mathsf{N}^{\mathsf{N}}_{\mathsf{R}^{\mathsf{N}}}}$$

Nitrosation of tertiary amines occurs very slowly. Loss of one substituent is required to form a stable nitrosamine.

$$\begin{array}{ccc} R'' & \longrightarrow & R'' N^{>O} & \text{loss of} \\ R'' N' R' & \longrightarrow & R'' N' R' & \text{substituent} & N^{>O} \\ R'' N' R' & R'' N' R' & R'' R'' & R'' R'' & R'' R'' \end{array}$$

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Example: N-nitrosamine impurities Control

Region/ Country	Scope	Assessment	Timings
EU	Registered drugs containing chemically synthesized API	API, Excipients, Primary packaging materials	26 March 2020 to complete risk assessment. 3 years to conclude testing
Canada	Registered drugs containing chemically synthesized API	API, Excipients, Primary packaging materials	March 2020 to complete risk assessment. 2 years to conclude testing
Switzerland	Registered drugs containing chemically synthesized API	API, Excipients, Primary packaging materials	May 2020 to complete risk assessment. 3 years to conclude testing
Brazil	Registered drugs containing chemically synthesized API	Finished medicinal products (API, other ingredients, manufacture process)	17th July 2020 (6 months) to inform ANVISA of any nitrosamine presence
Jordan	Registered drugs containing chemically synthesized API	Primary packaging materials only	16th February 2020 (3 months) to confirm suitability of material

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European Approach

Nitrosamines

- Sartans Article 31 Referral
- · Ranitidine
- EMA letter to MA Holders and 26 March 2020 deadline
- CEP holder reporting deadline 26 March 2020
- Ph Eur Monographs for sartans revised to include nitrosamine testing
- General monograph 2034 « Substances for Pharmaceutical Use » under revision

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Towards a Global Approach for nitrosamine control?

- Retrospective harmonisation of compendial standards is always a challenge
- Regional approaches to monographs in development
- How can Stakeholders help to foster worldwide standards?

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