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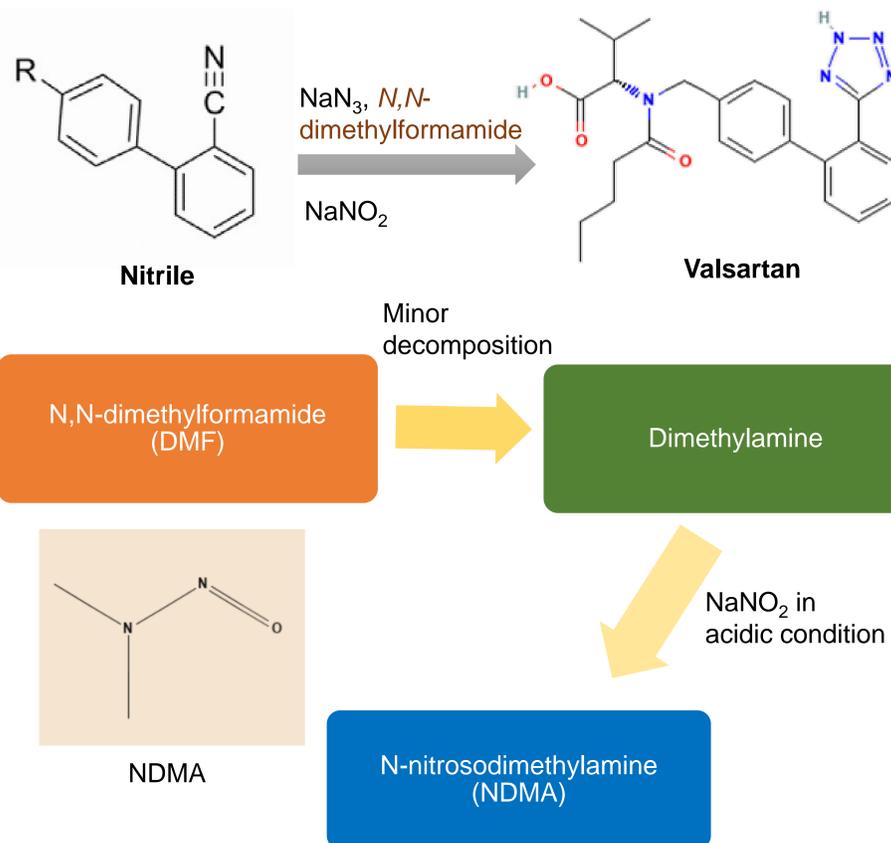
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## Introduction

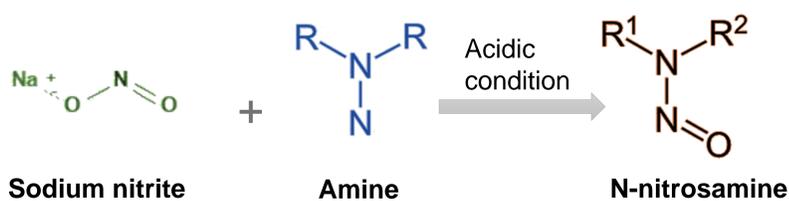
Nitrosamine impurities were detected in valsartan in July 2018, and later in other active pharmaceutical ingredients, containing a tetrazole ring in their structure (losartan and irbesartan). Recently, *N*-nitrosodimethylamine has been found in certain histamine-2-blockers (ranitidine, nizatidine) and in the antihyperglycemic medication metformin.



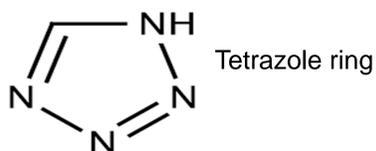
## Formation of Nitrosamine impurities in valsartan



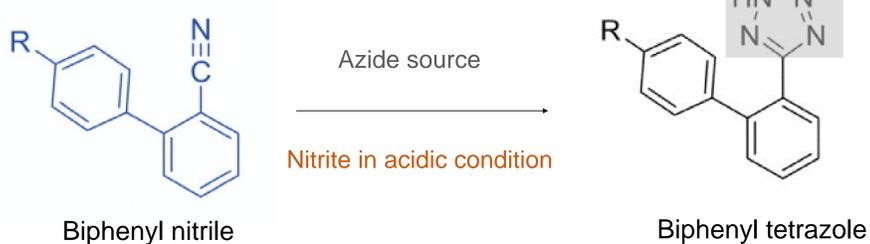
## Root causes for presence of Nitrosamine impurities



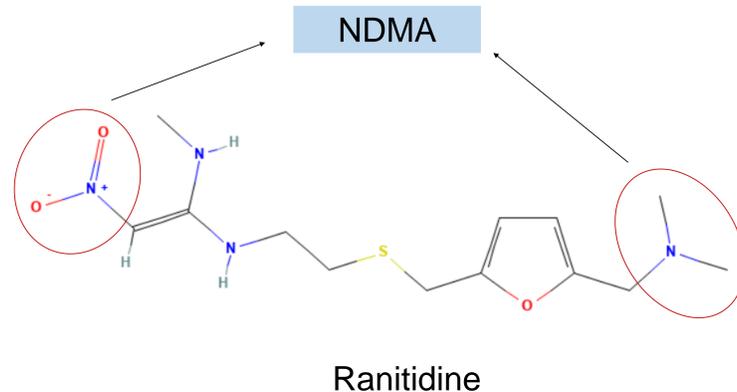
## Formation of Nitrosamine impurities in sartans



The process of tetrazole ring formation-root of nitrosamines contamination of sartans



## Formation of Nitrosamine impurities in ranitidine



## Conclusion

Knowing their mutagenic and carcinogenic effects the presence of nitrosamines in active pharmaceutical ingredients must be limited. All this implies the need primarily for identifying the main reasons for contamination with these impurities and then developing the appropriate methods for their detection and quantification.

Medicine regulatory authorities are taking steps to solve this problem, but also we need to highly improve our knowledge in this area and prevent future human exposure with these impurities through drug products.

## References

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