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## **Acrylamide Formation Mechanism In Heated**

The mechanism  
involves formation of a

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Schiff base followed by decarboxylation and elimination of either ammonia or a substituted imine under heat to yield acrylamide. Isotope substitution studies and mass spectrometric analysis of heated model systems confirm the presence of key reaction intermediates. Further confirmation of this mechanism is accomplished through

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selective removal of

# Mechanism In Heated Foods

## **Acrylamide Formation**

## **Mechanism in Heated Foods**

We present a mechanism for the formation of acrylamide from the reaction of the amino acid asparagine and a carbonyl-containing compound at typical cooking temperatures. The mechanism involves formation of a

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Schiff base followed by decarboxylation and elimination of either ammonia or a substituted imine under heat to yield acrylamide.

## **Acrylamide Formation Mechanism in Heated Foods | Journal ...**

We present a mechanism for the formation of acrylamide from the



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reaction of the amino acid asparagine and a carbonyl-containing compound at typical cooking temperatures. The mechanism involves formation of a Schiff base followed by decarboxylation and elimination of either ammonia or a substituted imine under heat to yield acrylamide. Isotope substitution studies and mass spectrometric analysis

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of heated model systems confirm the presence of key reaction intermediates.

## **Acrylamide formation mechanism in heated foods.**

We present a mechanism for the formation of acrylamide from the reaction of the amino acid asparagine and a carbonyl-containing compound at typical

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cooking temperatures.

# Mechanism in Heated Foods

involves...

## **Acrylamide Formation Mechanism in Heated Foods | Request PDF**

Studies to date clearly show that the amino acid asparagine is mainly responsible for acrylamide formation in heated foods after a condensation of its amino group with

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reducing saccharides  
or a...

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The results are based on literature surveys, examination of the analytical data published by the Swedish National Food Administration and other follow-up studies, contacts with

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international scienti. c  
networks, and  
observations from food  
companies. Results:  
The exact chemical  
mechanism (s) for  
acrylamide formation  
in heated foods is  
unknown.

## **Acrylamide in food: mechanisms of formation and ...**

Acrylamide Formation  
Mechanism in Heated  
Foods. Journal of  
Agricultural and Food

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Chemistry 2003, 51  
(16), 4782-4787. DOI:  
10.1021/jf034180i.

Mendel Friedman.  
Chemistry,  
Biochemistry, and  
Safety of Acrylamide. A  
Review.

## **Analysis of Acrylamide, a Carcinogen Formed in Heated ...**

Although researchers  
are still unsure of the  
precise mechanisms by  
which acrylamide

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forms in foods, many believe it is a byproduct of the Maillard reaction. In fried or baked goods, acrylamide may be produced by the reaction between asparagine and reducing sugars ( fructose , glucose , etc.) or reactive carbonyls at temperatures above 120 °C (248 °F).

**Acrylamide -**  
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The method of liquid chromatographic tandem mass spectrometry was utilized and modified to confirm and quantify acrylamide in heating cooking oil and animal fat. Heating asparagine with various cooking oils and animal fat at 180 °C produced varying amounts of acrylamide. The acrylamide in the different cooking oils



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and animal fat using a constant amount of asparagine was measured.

## **Acrylamide formation in vegetable oils and animal fats ...**

The formation of acrylamide was measured and shown in Fig. 2A. There was no acrylamide produced at 100 °C due to the low reaction temperature. This

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finding is consistent with previous literature (Zhang et al., 2009). When heated at 130 °C, acrylamide was generated after 6 min at 130 °C.

## **Simultaneous generation of acrylamide, $\beta$ -carboline ...**

Abstract. The formation of acrylamide (AA) from L-asparagine was studied in Maillard model systems under

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pyrolysis conditions. While the early Maillard intermediate N-glucosylasparagine generated ~2.4 mmol/mol AA, the Amadori compound was a less efficient precursor (0.1 mmol/mol). Reaction with  $\alpha$ -dicarbonyls resulted in relatively low AA amounts (0.2–0.5 mmol/mol), suggesting that the ...

**Mechanisms of**  
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Reports that heat processing of foods induces the formation of acrylamide heightened interest in the chemistry, biochemistry, and safety of this compound. Acrylamide-induced neurotoxicity, reproductiv

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Ph.D. Procter Gamble  
Snacks and Beverage  
Analytical and  
Microbiology

Cincinnati, Ohio 2  
ACRYLAMIDE SHOCK  
Press Release April 24,  
2002 Stockholm

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University/Swedish NFA revealed acrylamide presence in variety of cooked foods. 3

## **PPT - Acrylamide: Mechanism of Formation in Heated Foods ...**

mechanism and the concentrations of the initiator.  $G$  need not be a constant. Thus, as polymerization proceeds, conversion increases with time. If the polymerization

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process is exothermic then the increasing conversion results in the release of heat with time. In an adiabatic system, this heat released can be measured as a temperature

## **Experiment 1: Polymerization of acrylamide in water**

Abstract. The recent report of elevated acrylamide levels in heat processing foods

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evoked an international health alarm. Acrylamide, an acknowledged potential genetic and reproductive toxin with mutagenic and carcinogenic properties in experimental mammals, has been found in various heat processing foods. Many original contributions reported their findings on the formation mechanism and possible reduction



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methods of acrylamide.

## Mechanism In Heated Foods

### **Formation and Reduction of Acrylamide in Maillard Reaction ...**

It has been reported that acrylamide, a potential carcinogen, is formed from the reaction of L-asparagine (L-Asn) and reducing sugars contained in foods during heating processes and free asparagine is a limiting

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factor for acrylamide  
formation.

## Mechanism In Heated Foods

### **Effective treatment for suppression of acrylamide ...**

Mechanisms of  
Formation Acrylamide  
is not a substance that  
is added to food, but it  
is formed in food  
during heat processing.  
Research indicates that  
heating of food could  
be an important source  
of acrylamide  
formation.

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## **Journal of Food**

Mestdagh, F, Maertens, J, Cucu, T, et al. Impact of additives to lower the formation of acrylamide in a potato model system through pH reduction and other mechanisms. Food Chem. 2008 ;107(1): 26 - 31 .

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