

Aspartame

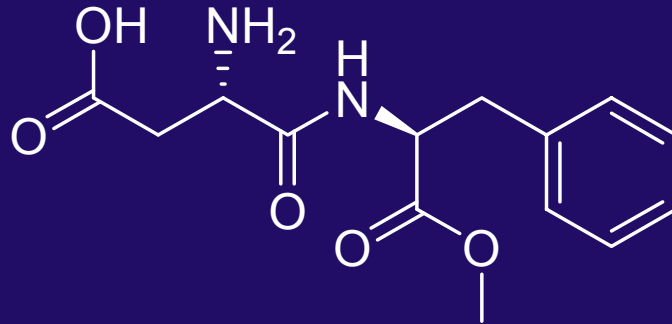
Process for production of a low-calory sweetener

Biocatalysts involved: **Aspartase** and **Thermolysin**

Unlimited. **DSM**



Aspartame

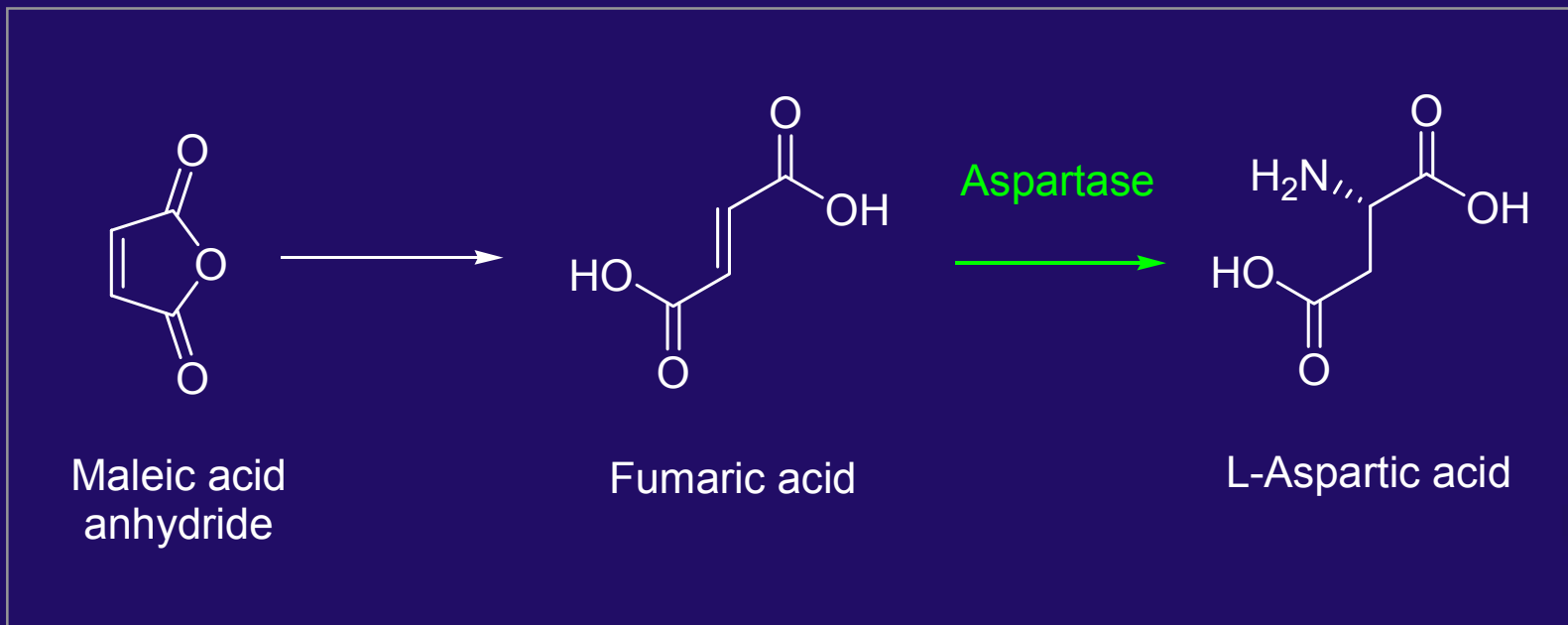


- L- α -Asp-L-Phe-methyl ester
- 150-200x sweeter than sucrose
- Other isomers: bitter, non-sweet (purity)
- Energy content: 17 kJ/g
- Splits into Asp and Phe in gastrointestinal tract
- Use: approx. 80% in US, of which >80% in beverages
- History:

1965	discovered by J.Schlatter (G.D. Searle)
1981	definitive FDA approval
1992	NutraSweet US patent expiration

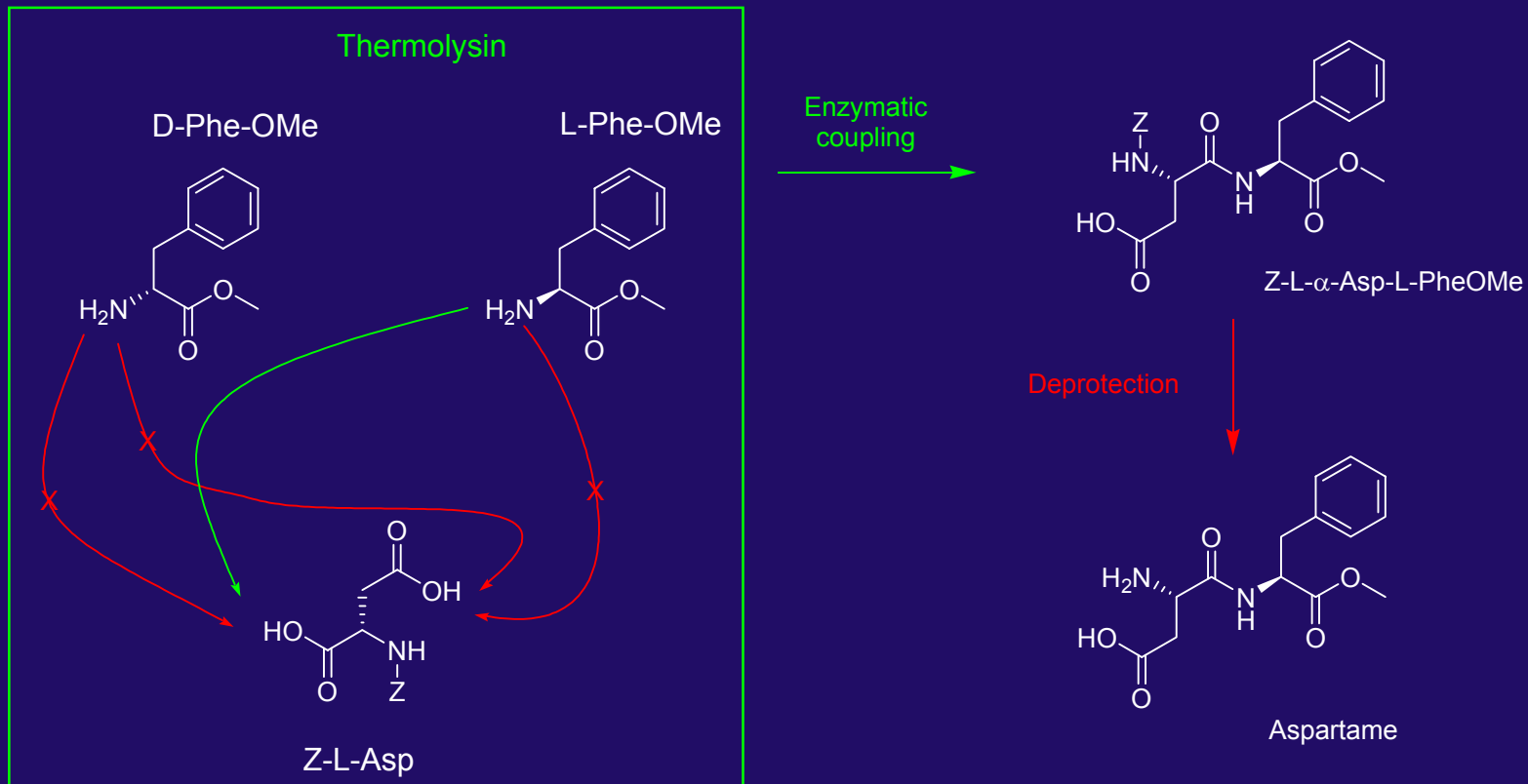
Aspartame building block - Aspartic Acid

- Aspartase: an enzyme that adds ammonia to fumaric acid
- Production at DSM Fine Chemicals in Linz (AU)



Aspartame – Themolysin coupling

- Enzyme **Themolysin** selects the right coupling position out of four
- Production at Holland Sweetener Company (DSM Fine Chemicals)



- Aspartame is free of bitter side products
- Complete *chemical* synthesis would need protective and activating groups