



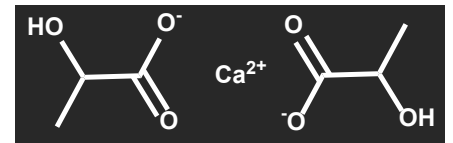
That crunch that comes with some aged cheeses arises from crystals. The two types are calcium lactate crystals and tyrosine crystals.

CALCIUM LACTATE



The white powdery smear found on many aged ched-dars are crystals of the compound calcium lactate. Calcium lactate is formed as the cheese ages when lactic acid reacts with calcium in the cheese. They don't have any flavor themselves, but usually signify a piece of well-aged cheese that will be flavorful.

calcium lactate

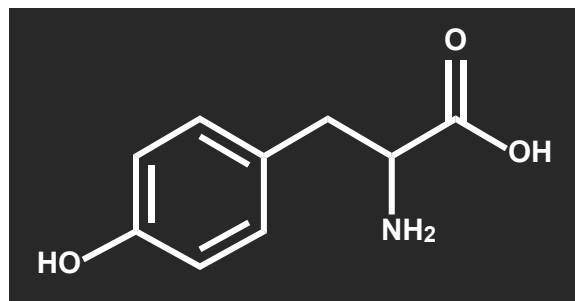


TYROSINE



Tyrosine is an amino acid. Amino acids are the things that make up proteins. When several amino acids are joined together, they are called peptides. When peptides get really long, they have become full-blown proteins.

Tyrosine crystals are a result of the cheese having *Lactobacillus helveticus* as a bacterial culture (or adjunct). This culture is used in a lot of hard Italian and Dutch-style cheeses, among others. This bacteria has enzymes that break down peptide (protein) fragments into individual amino acids, and tyrosine is one of them. It uses some of the tyrosine for nutrition (i.e. eats it), but has more than it can use. So the tyrosine starts to build up and excess tyrosine eventually forms crystals.



tyrosine

Tyrosine is very insoluble in water, so the high amounts surrounding *L. helveticus* colonies form distinct crystal specks as opposed to the powdery smear usually associated with calcium lactate.