

# Periodic graphics

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A collaboration between C&EN and  
Andy Brunning, author of the popular  
graphics blog **Compound Interest**

## THE CHEMISTRY OF BITTERS

Originally used as medicines, bitters are now popular cocktail flavorings. This graphic gives you a taste of the different types of bitters and the compounds that lend them their distinct tastes.

### TYPES OF BITTERS

Bartenders everywhere use a dash or two of bitters to flavor cocktails. Bitters include water and alcohol; botanical ingredients are soaked in the alcohol to extract compounds for flavoring. Some types of bitters (top) are paired with their key botanical ingredients (bottom) below.



AROMATIC

Gentian roots



CITRUS

Citrus peels



CELERY

Celery seeds



FRUIT

Cherries



SPICED

Cloves



FLORAL

Chamomile



CHOCOLATE

Cocoa



SPICY

Chilies

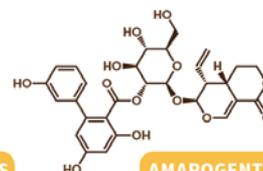
Commercial bitters contain many different botanical ingredients—and a multitude of compounds. For example, Angostura bitters are said to contain over 40 ingredients; the exact blend is a closely guarded secret.



### COMPOUNDS IN BITTERS



GENTIAN ROOTS

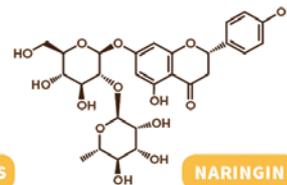


AMAROGENIN

Gentian root, one of the key ingredients in Angostura bitters, contains bitter compounds including amarogentin.



CITRUS FRUITS

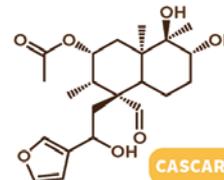


NARINGIN

Bitter compounds extracted from citrus fruit peels include naringin, found in particularly high levels in grapefruits.



CASCARILLA



CASCARILLIN

Cascarilla bark is another common ingredient in bitters. It contains cascarillin, a diterpenoid compound with a bitter taste.