Mineral Supplement Facts - Salts vs Chelates by John W Jones, MD

Percent calcium (Ca) in Calcium mineral formulas:

Calcium Carbonate = 40%
move pH to alkaline, requires HCl for absorption. Studies have shown 31% absorption (+/-) of elemental (Ca)
Calcium Citrate = 22%
move pH to alkaline, some chelate absorption properties
Calcium Gluconate = 9.3%
neutral pH
Calcium Lactate = 13 to 15%
move pH to acid

Calcium Chelates = 20%

Chelate: a chelating agent combines with a metal ion though coordinate covalent bonds forming a ring-like molecule

- Complex = same metal ligand-bond as chelate
- Salt - same coordinate bond exists but is only attached at carboxyl radical (inorganic)

Chelate: not absorbed as an ion, but carried or "smuggled" into the cell with its dipeptide

- Absorbed in the upper ½ of small intestine dipeptide-like chelate
  There are two heterocyclic rings, forming ten bonds
- Amino acid chelate not as stable as dipeptide chelate
- Larger polypeptide chelates must be further digested, often destroying the chelate
  This system is 2.5 to 3 times as efficient as ionic transport (salts)
- Studies have shown that chelated minerals often go from the gut to the site of action unchanged

Chelate

- The most **reliable** absorption, very stable molecule, doesn't cause diarrhea
- Can be taken with food or on empty stomach

Chelate continued

- Not bound in the GUT by phytates, oxalates or fat
- Rapid transport and onset of action
- Does not interfere with the absorption of other minerals
  ie: ca & mg when used together vie for the same absorption sites

Mineral salts are inorganic (carbon free) elements
Ca and magnesium (Mg) do not move through biological systems well as ions

- Must be converted to a chelate for good transport
- See below for side effects of Calcium Carbonate

Calcium Apatite - Ground up bone
Colloidal Calcium

- Cold water extract of shale that has been filtered
- Ca chelate has been added to this extract

Citrate (really a salt)

- Well absorbed
- Uses both mechanisms of absorption
- Must be changed to a chelate intracellularly so onset of action is slowed
- May increase the absorption of Aluminum

Calcium carbonate may cause the following side effects:

- upset stomach
- vomiting
- stomach pain
- belching
- constipation
- dry mouth
- increased urination
- loss of appetite
- metallic taste

Note: Calcium lactate has many of the same side effects