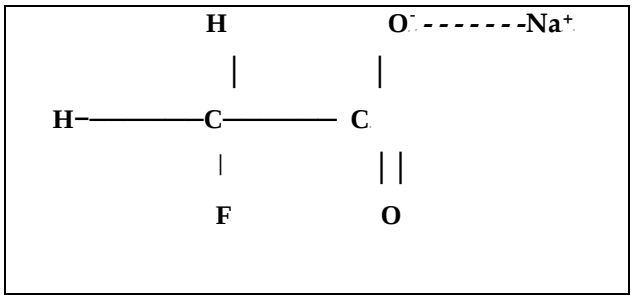
1080 DOES NOT BREAK DOWN INTO SALT AND VINEGAR!

Some claim that adding water, as in rain spontaneously causes the dissociation of the fluorine and acetate part of the 1080 molecule. This in turn has led to the 'myth' that 1080 breaks down into harmless by-products, namely "salt and vinegar". Salt (or common table salt) is sodium chloride (NaCl). Vinegar (or acetic acid) is CH_3COOH. **Sodium monofluoroacetate ($C_2H_2FNaO_2$)** cannot "break down" into salt and vinegar. It does not contain the element Chlorine (Cl) so cannot form table salt. Vinegar cannot be a product of the degradation of sodium monofluoroacetate.

1080, sodium fluoroacetate, sodium monofluoroacetate and even sodium fluoroacetic acid are all names that have been used for the same **manufactured compound**. It should be called sodium monofluoroacetate.

The chemical formula of Sodium monofluoroacetate (1080) is $C_2H_2FNaO_2$. It contains two carbon atoms, two hydrogen atoms, one fluorine atom, one sodium atom, and two oxygen atoms in every molecule of the compound. **Notice there is not a chlorine atom in sight.**

Carbon chemistry (organic) is different to that of all the other elements, which are inorganic. It does not form ions (atoms with electrons either added or taken away and thus carrying positive or negative charge). Instead **each carbon atom has 4 bonds**: that is what the lines drawn out in the formula structure below represent. Each bond shares two electrons (subatomic particles which are essential for forming bonds between elements) between the carbon atom and the atom of the element it is joined to. In the structure drawn out below, the first carbon atom forms single bonds with hydrogen (two of them) and fluorine and the adjacent carbon atom. That gives you the 4 bonds. The second carbon atom forms single bonds with the adjacent carbon atom, and a single bond with one of the oxygen atoms, and a double bond with the other oxygen atom. This gives you 4 bonds. Oxygen needs to form double bonds with carbon, and/or join onto another inorganic element atom in a loose ionic bond, shown as the dashed line between O^- and Na^+ in the diagram.



The **carbon-carbon bond** in the sodium mono-fluoroacetate molecule **is less stable (weaker) than the carbon-fluorine bond**, and so over time and with hydration (adding H_2O), sunlight can break the bond down, and the molecule can degrade into **sodium bicarbonate ($NaHCO_3$) and methyl fluoride (CH_3F).** This could happen if the molecules are lying for some time in surface water in sunlight. How likely is this to be the situation in a forest? If the molecules have entered streams or ground water, they are also unlikely to break down via sunlight.

The **chemical equation for this possible break down**, if it occurs, is:

$$CH_2FCOONa + H_20 \rightarrow NaHCO_3 + CH_3F$$

with all elements and their symbols accounted for.

Methyl fluoride (CH_3F) is a volatile fluoro-hydrocarbon which rots the ozone layer and contributes to the ozone hole! **Sodium bicarbonate ($NaHCO_3$) is a metal salt (common name baking soda).** Metal salt is the general scientific term for a positively charged metal ion (Na+) joined to a negatively charged ion of an element, or a radical (group of elements behaving like an element) - in this case the bicarbonate ion (HCO_3^-). It is this term (metal salt) which may have contributed to the 'salt and vinegar' story.
When water is added to sodium monofluoroacetate it "dissolves" but does not lose its integrity. It is diluted, but the molecules are still sodium monofluoroacetate molecules. **When you add coffee powder or granules to water they dissolve, but you are still drinking coffee.**

Conclusion: The information given to the public, about the break down of 1080 into harmless products is incomplete and incorrect. This needs to be acknowledged by the agency responsible, namely Forest and Bird.

The possible breakdown products when the C-C bond is broken in sunlight, over time and in solution, are sodium bicarbonate and methyl fluoride.