

Did you know?

In *Fight Club*, Tyler Durden is quite the amateur chemist – as well as his napalm recipe, he also explains how to make soap by hydrolysing fat. Fat that he steals from a liposuction clinic!

On-screen chemistry

Napalm: its devastating effects – on-screen and off

Jonathan Hare *investigates these destructive chemicals*



'I love the smell of napalm in the morning'

The 1979 movie *Apocalypse Now* is about the horrors and psychological trauma of the Vietnam War. A major cause of trauma on both sides was the widespread use of napalm – the chilling scenes of burning fields, property and people from the news reels are unforgettable. In the film, a US Army officer, Lieutenant Colonel Bill Kilgore, exclaims 'I love the smell of napalm in the morning'. It's an often quoted line, but with knowledge of napalm's devastating effects, it is a viewpoint we should find appalling.

Combustible orange juice

In the 1999 film *Fight Club*, the character Tyler Durden claims 'if you mix equal parts of gasoline and frozen orange juice concentrate, you can make napalm.'² So what is napalm and how is it really made? Napalm is a general name for a thick oil or jelly mixed with fuel such as gasoline (petrol). In Durden's 'recipe', the gasoline fuel is

mixed with orange juice concentrate that provides the sticky oil. Napalm's name comes from two of the compounds used to make the oily gel in the first preparations: naphthenic and palmitic acids. Liquid fuels burn quickly, but mixing them with a gel allows the fuel to burn with a hot slow flame, thereby maximising the damage it does to buildings, vegetation and, of course, people.

The term 'napalm' is used for a number of chemically distinct materials. Napalm B, used extensively in the Vietnam war (containing polystyrene and benzene) is very sticky and can't easily be removed from skin. Versions of napalm B containing white phosphorus will even burn underwater (if there is trapped oxygen in folds of cloth, for example) so even jumping into rivers and lakes won't help

those unfortunate souls attacked with this vile weapon. Victims will either die from severe burns, from the effects of the prolonged intense heat (heat stroke), or possibly from carbon monoxide and phosphorus poisoning from the fumes given off.

Total destruction

When it is dropped from an aircraft, a single napalm 'bomb' is capable of completely destroying an area covering thousands of square meters. Napalm was dropped on German and Japanese cities in the second world war and used extensively by the US in Vietnam from 1950s to 1970s. It is particularly feared because, unlike standard bombs and bullets, it flows and spreads very effectively – napalm is not easy to escape. For example, it can form a river of burning liquid that can flow into hidden underground trenches like no other weapon.

Now that the use and appalling effects of napalm have been well documented, many humanitarian groups around the world are trying to ban its use.

References

- 1 *Apocalypse Now*, 1979, 20th Century Fox
- 2 *Fight Club*, see *InfoChem*, May 2007

Naphthenic acid (top)
Palmitic acid (bottom)

