



ReAction! Chemistry in the Movies

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Chemistry Movies Blog

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The Elemental Composition of Polydichloric Euthimal in *Outland* (1981)

In the future noir *Outland* (1981), the titanium on Jupiter's moon Io is mined by 2144 people employed by Con-Am Mining, which is owned by the League of Industrialized Nations. Law Enforcement Marshal W. T. O'Niel (Sean Connery) is transferred to this post because he's a "troublemaker". Shortly after arriving, he is called to investigate two apparent suicides. He becomes suspicious because neither victim left a note and the company doctor didn't perform an autopsy. His wife decides to return to Earth with their son because she can't stand the place after only two weeks. When O'Niel attends his first company meeting, General Manager Shepard says they've broken all production records since he's been there. Then, O'Niel visits Dr. Lazarus (Frances Sternhagen) where he learns there were twenty-eight suicides in the past six months but only two in the six months before that.

After a third miner goes wacko and threatens to kill one of the company's prostitutes, the law enforcement officers are able to rescue the prostitute but they kill the miner. In the 3.5-minute scene from 39:00, O'Niel brings a sample of the miner's blood to Dr. Lazarus for analysis. She injects it into a machine and calls out, "No alcohol. Proteins. Carbohydrates. No nicotine. Tranquilizers—company issue. What's this?" The computer screen says: Carbon: 6.987%, Hydrogen 70.55%, Oxygen 13.62% and "para-cyclic rad". Lazarus says it's a new kind of narcotic synthetic and then the screen reads "Euthimal Tertiary Radical" along with large numbers of circles in a cashew shape. Lazarus says "Those stupid bastards are taking polydichloric euthimal. The army tested it a few years ago. An amphetamine that makes you feel wonderful and then it fries your brain."

The elemental analysis on Dr. Lazarus' computer screen only adds up to 91.15%. Since all tranquilizers have nitrogen, it is safe to assume that there is also 8.85% nitrogen. Using these percentages, the elemental composition can be calculated to be 69.99 H, 0.582 C, 0.632 N, and 3.00 O. Since it is not acceptable to have fractional composition, all of these amounts must be divided by the least abundant element to arrive at the actual composition. In this case, it seems reasonable to divide by the average of 0.582 and 0.632 to find 115 H, 1 C, 1 N, and 5 O after some rounding. Since this ratio of hydrogen to the other elements is impossibly high, there was clearly a mistake in the computer's readout.

Respond to this blog with your thoughtful ideas about the composition (or structure) of the amphetamine named polydichloric euthimal.