

Four banned ozone depleters detected in the atmosphere

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The ozone layer faces a new threat: a surge in ozone-eating chlorofluorocarbons (CFCs), specifically four types previously undetected in the atmosphere. CFCs have been almost completely phased out under an international convention, but confidentiality clauses in the treaty mean it isn't clear if one of the chemicals now detected, called CFC-113a, is illegal or allowed under official exemptions.

[Johannes Laube](#) of the University of East Anglia in Norwich, UK, says his team detected the four ozone-depleting substances by analysing air trapped in snow in Greenland and air samples from Tasmania, Australia. Their analysis shows that the four chemicals discovered in the atmosphere for the first time – CFC-112, CFC-112a, CFC 113a and HCFC-133a – are being emitted in the northern hemisphere, but not precisely where or by whom.

The big issue, he says, is CFC-113a. Total emissions of this compound are still relatively small, but they are rising fast, more than doubling between 2010 and mid-2012. It is used as a feedstock in manufacturing hydrofluorocarbons – widely used substitutes for CFCs in air-conditioning systems – and some insecticides.

Industrial loophole

All four chemicals are banned by the 1987 [Montreal Protocol](#) on ozone-depleting substances. But, says Laube, "CFC-113a is covered by a loophole in the protocol that allows industries to apply for exemptions." The ozone secretariat at the UN Environment Programme in Nairobi, Kenya, received reports from governments that CFC-113a was being used to manufacture pesticides in 2003, but has not published details of the amounts involved.

"We simply don't know if the emissions we have found in the atmosphere come from exempted emissions or if they are from some illegal manufacture somewhere," said Laube. "Either way, the emissions are increasing fast, which makes this worrying."

[Martyn Chipperfield](#), professor of atmospheric chemistry at the University of Leeds, UK, said the amounts now detected are less than 1 per cent of those emitted before the Montreal Protocol was signed.

[Steve Montzka](#) at the US National Oceanic and Atmospheric Administration in Boulder, Colorado, agrees. "We are talking about very minor releases," he says. "The paper's benefit is to put these compounds on our radar to help ensure they don't become significant."

But Laube warned that the four CFCs his team has reported are probably the tip of the iceberg. "We haven't quantified the volumes yet, but we have found dozens more previously undetected ozone depleters, and we are still looking," he says.

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