A rapid, low blank method for the extraction of osmium from geological materials will be presented. As with existing techniques, this new method relies upon the oxidation of Os in the sample solution to OsO₄ and utilizes the volatile nature of this oxide. In contrast to previous distillation methods where an Os oxide-bearing carrier gas is bubbled through chilled HCl or HBr, however, the Os is caught in sulfuric acid coated on the inner surface of a small-scale cold trap. Once the distillation is completed, the trapped Os is extracted into 500 µl HBr conc. and can be subjected to a final cleaning step employing conventional micro-distillation techniques (e.g. Nägler & Frei 1997).

The entire extraction procedure takes app. 60 min. at 65 °C and requires only 2 µl H₂SO₄ to trap the osmium, which is achieved with great efficiency. Thus, apart from the digestion medium, the extraction and recovery of Os using this technique employs a total of only 502 µl of reagents instead of 5 - 10 ml used in conventional procedures. The efficiency of the method and the low reagent volumes required for the distillation produce yields of more than 80% and total procedural blanks of only 50 - 100 fg Os on a routine basis.

The method is well suited to performing highly precise Re-Os analyses on various sample types, such as whole rocks (OFB, OIB & IAV), sulphides, limestones and phosphates (conodonts).