

This is a preview of "ISO 4491-3:1997". [Click here to purchase the full version from the ANSI store.](#)

Second edition
1997-04-01

Metallic powders — Determination of oxygen content by reduction methods —

Part 3: Hydrogen-reducible oxygen

*Poudres métalliques — Dosage de l'oxygène par les méthodes de
réduction —*

Partie 3: Oxygène réductible par l'hydrogène



Reference number
ISO 4491-3:1997(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 4491-3 was prepared by Technical Committee ISO/TC 119, *Powder metallurgy*, Subcommittee SC 2, *Sampling and testing methods for powders (including powders for hardmetals)*.

This second edition cancels and replaces the first edition (ISO 4491-3:1989), clauses 7 and 8 of which have been technically revised.

ISO 4491 consists of the following parts, under the general title *Metallic powders — Determination of oxygen content by reduction methods*:

- *Part 1: General guidelines*
- *Part 2: Loss of mass on hydrogen reduction (hydrogen loss)*
- *Part 3: Hydrogen-reducible oxygen*
- *Part 4: Total oxygen by reduction-extraction*

© ISO 1997

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Organization for Standardization
Case postale 56 • CH-1211 Genève 20 • Switzerland
Internet central@iso.ch
X.400 c=ch; a=400net; p=iso; o=isocs; s=central

Printed in Switzerland

This is a preview of "ISO 4491-3:1997". Click [here](#) to purchase the full version from the ANSI store.

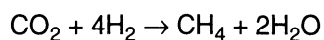
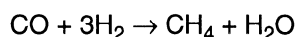
Introduction

The International Standard which the first edition of this part of ISO 4491 (ISO 4491-3:1989) replaced (ISO 4993:1981) described one particular arrangement of apparatus and procedure for the determination of hydrogen-reducible oxygen. However, it has since been established that other schemes will give equally valid results and these are therefore described in this part of ISO 4491.

In addition, the scope of the method has been extended to include powders containing carbon.

If carbon is present in the powder, some metal oxides which may otherwise have been reduced by hydrogen are instead reduced by carbon, producing carbon monoxide or carbon dioxide. These products are not measured by the titration with Karl Fischer reagent which is used to determine the amount of water produced. Consequently a lower result will be obtained for the hydrogen-reducible oxygen content.

This interference is eliminated by passing the gases emerging from the reduction furnace over a catalyst which converts the CO and CO₂ formed into methane and water, in accordance with the following equations:



The conversion reaction is carried out at 380 °C over a nickel catalyst.

NOTE — Certain oxides may be partially reduced by carbon which otherwise would not be reduced by hydrogen. In such cases the interpretation of results should be made with great care [see ISO 4491-1:1989, subclause 4.1.2 d)].

This is a preview of "ISO 4491-3:1997". [Click here to purchase the full version from the ANSI store.](#)

This page intentionally left blank