

# Open nano porous "base metals and semi-metals", their surface treatments and composites

Porous Fe, Si, C, W, Ti, Cr, Zr, Nb, Mo, Ta, their alloys → Possible !

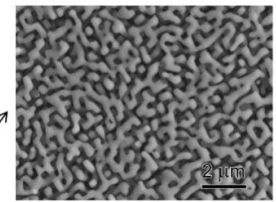


Fig 1 : Operative Example

## Overview

In the conventional technique, porous metals with nano- or micro meter-sized micropores (hereafter referred to as nano-microporous metals) are prepared from alloys of noble metals and base metals by dissolving the base metals in an aqueous solution. This aqueous solution deallocation technique is carried out under oxidizing conditions, so that only noble metals that can withstand this oxidizing environment can be produced, but many practical base metals that cannot withstand oxidizing conditions are easily oxidized, making it impossible to produce porous metals.

This invention makes it possible to fabricate nano- and microporous materials of base metals and semi-metals and their alloys, which in principle could not be produced by conventional methods. Examples: We have succeeded in producing nano porous materials in pure metals such as Iron, Silicon, Carbon, Tungsten, Titanium, Chromium, Zirconium, Niobium, Molybdenum, and Tantalum alloys such as beta titanium and stainless steel.

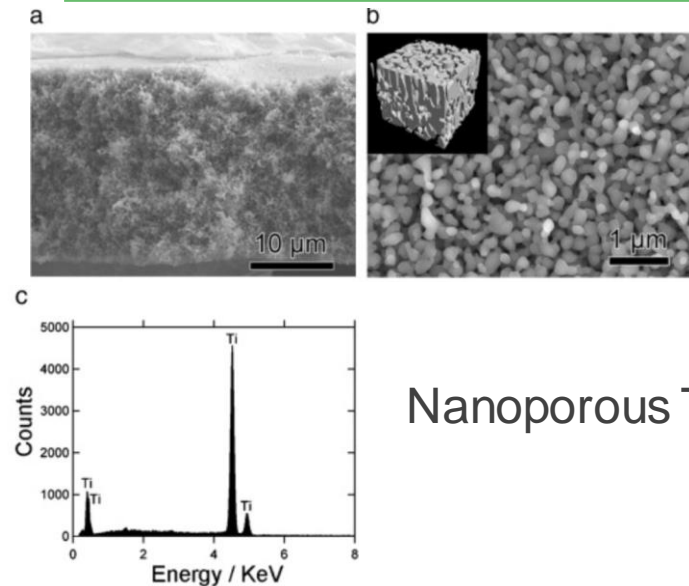
## Product Application

- Catalyst
- Electrode
- Filter
- Medical material
- Sensing material

## IP Data

IP No. : JP 5678353、US9,279,186、DE112010005201.84  
 Inventor : KATO Hidemi、WADA Takeshi et al.  
 Admin No. : T10-043

## Features・Outstandings



Nanoporous Ti

## Related Works

- [1] Materials Letters Volume 65, Issue 7, 15 April 2011, Pages 1076-1078  
 [2] までりあ Materia Japan 第52巻 第 8 号(2013)「卑・半金属およびそれらの合金によるオープンセル型ポーラス材料の開発」

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