



HAL
open science

Knudsen effusion mass spectrometry: application to the thermodynamic study of alloys

I Nuta, C Chatillon, S Chatain, C Guéneau

► To cite this version:

I Nuta, C Chatillon, S Chatain, C Guéneau. Knudsen effusion mass spectrometry: application to the thermodynamic study of alloys. TOFA 2020 - 17th Discussion Meeting on Thermodynamics of Alloys, TOFA, Sep 2020, Bad Staffelstein, Germany. hal-04900976

HAL Id: hal-04900976

<https://hal.science/hal-04900976v1>

Submitted on 20 Jan 2025

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

KNDUDSEN EFFUSION MASS SPECTROMETRY: APPLICATION TO THE THERMODYNAMIC STUDY OF ALLOYS

I. Nuta¹, C. Chatillon¹, S. Chatain², C. Guéneau²

¹ *Univ. Grenoble Alpes, CNRS, Grenoble INP, SIMaP, F-38000 Grenoble, France
1130 rue de la piscine BP 75 38402 Saint Martin d'Hères
E-mail address: ioana.nuta@ grenoble-inp.fr*

² *Laboratoire de Modélisation, de Thermodynamique et de Thermochimie, CEA Saclay-
DEN/DANS/DPC/SCP, 91191 Gif-sur-Yvette Cedex, France.*

The high temperature mass spectrometry method is a standard method for the study of chemical equilibria at high temperature and vaporization processes. For studies involving complex mixtures, as alloys, the multiple Knudsen cell –high temperature mass spectrometry is the very usefull device to perform thermodynamic activity measurements. The present work summarizes the evolution of the efforts done in order to elucidate the real nature of the collected effusion beams by any detectors including the mass spectrometers in relation with different physico-chemical phenomena occurring at the effusion orifice or near the edges of these orifices such as spurious molecular flows. We illustrate it with the results obtained about the iron–zirconium system[1].

References:

1. Chatain, S., C. Guéneau, and C. Chatillon, "High temperature mass spectrometry: Application to the thermodynamic study of the Fe–Zr system". *Journal of nuclear materials*, 344 (2005) 281-284.