

# DC Magnetron Sputtering Al

## Zr

### Characterization of Zr Coatings Deposited Al Cladding by DC Magnetron Sputtering

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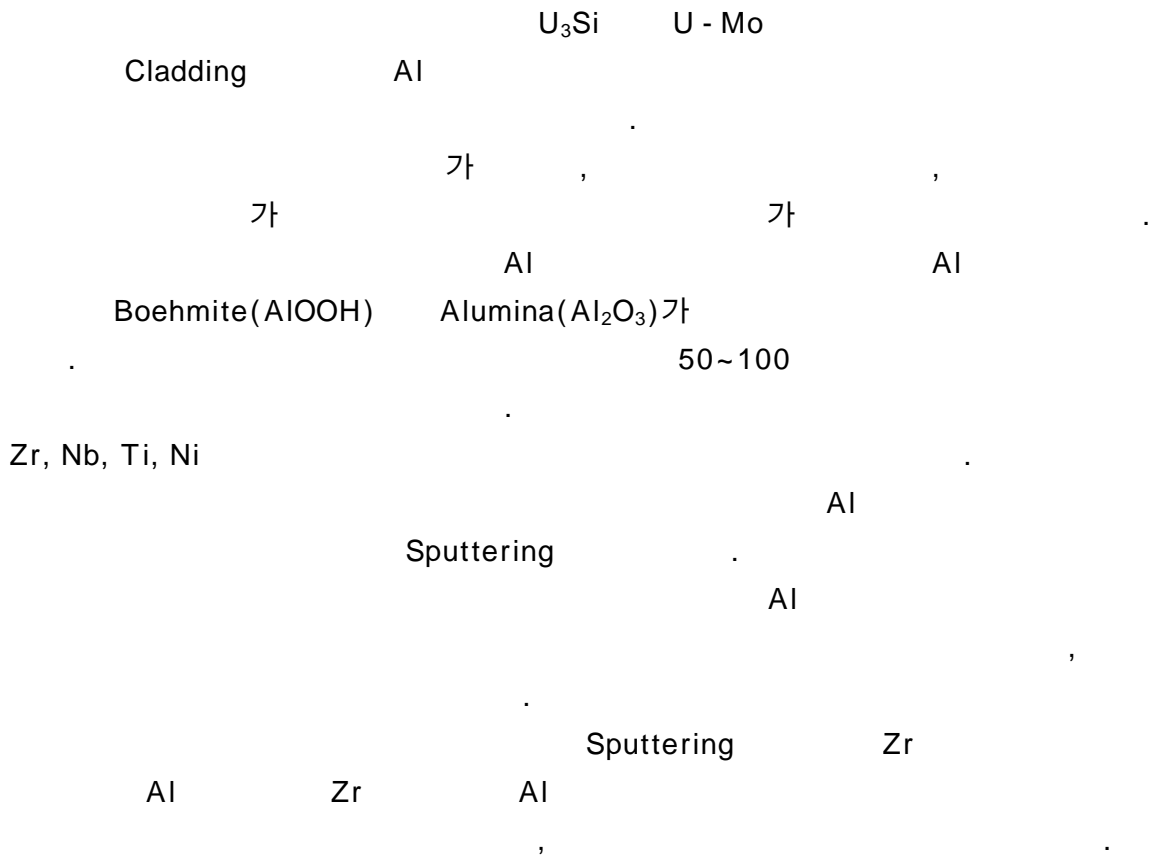
150

U-Mo Cladding Al  
Boehmite  
가 가  
Al Zr Magnetron Sputtering  
Zr

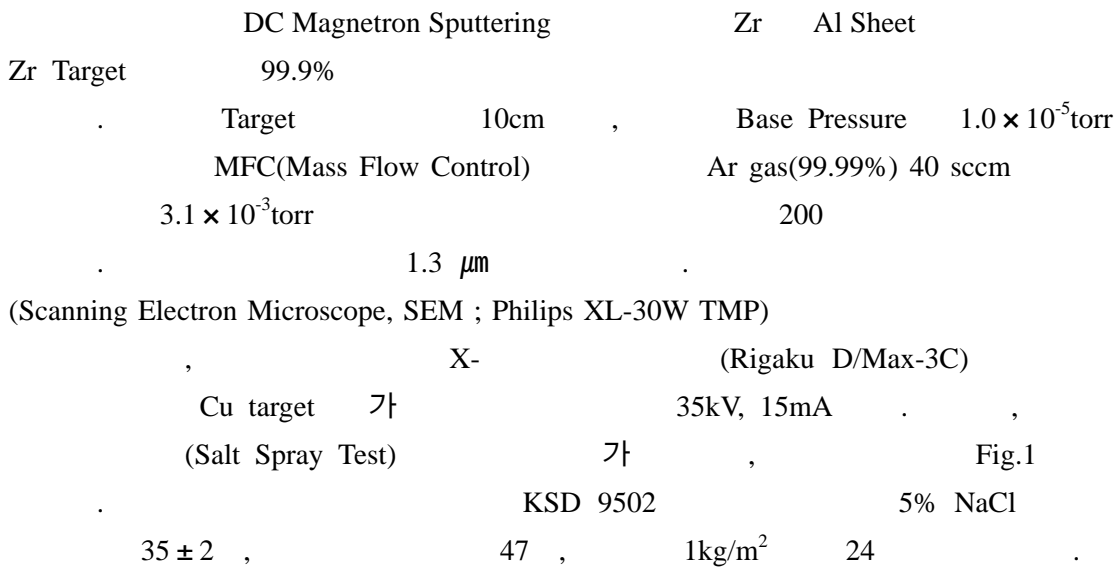
### Abstract

The U-Mo fuel meat for research reactor is coated with Al cladding material. The Al cladding is reacted with coolant water to form boehmite, resulting in the decrease of thermal conductivity. This leads to the increase of fuel temperature and the failure of the U-Mo fuel. In this study, we coated Zr as a protection layer of Al using magnetron sputtering. Effect of deposition temperature on the crystallinity and microstructure of the Zr coated layer was investigated and the corrosion resistance was evaluated using a salt spray test.

1.



2.



3.

3.1

50 , 100 , 200 Zr .  
 Fig.2 XRD pattern . Fig.2  
 X - Peak 가  
 Chamber 가  
 (002) Zr peak 가 (002), (101), (103)  
 가 가 (002)

3.2

Fig. 4 Zr coating . (a) Al  
 substrate (b)Room temperature, (c) 50 , (d) 100 , (e) 200  
 . SEM image 가 가  
 Fig. 1 XRD pattern  
 가 가 Zr coating

3.3

Al substrate Zr . Fig.3  
 Zr XRD pattern . Fig.3  
 가 Zr Zr peak Intensity  
 XRD pattern ZrO<sub>2</sub> peak Al peak 가

4.

sputtering cladding Al Zr DC magnetron  
 (002) (002),(101),(103) Zr 가 가  
 KSD 9502 24 Al Zr

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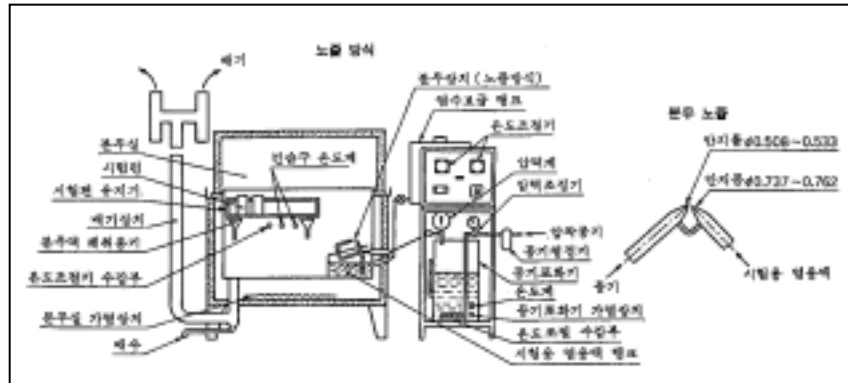


Fig.1 Schematic diagram for salt spray test

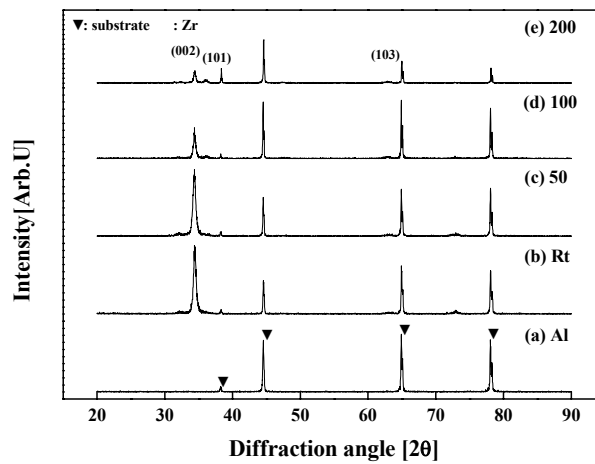
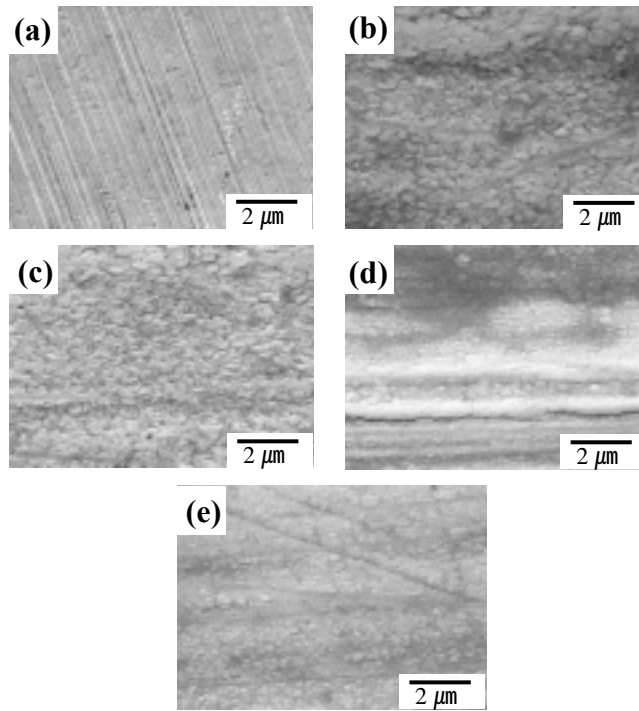
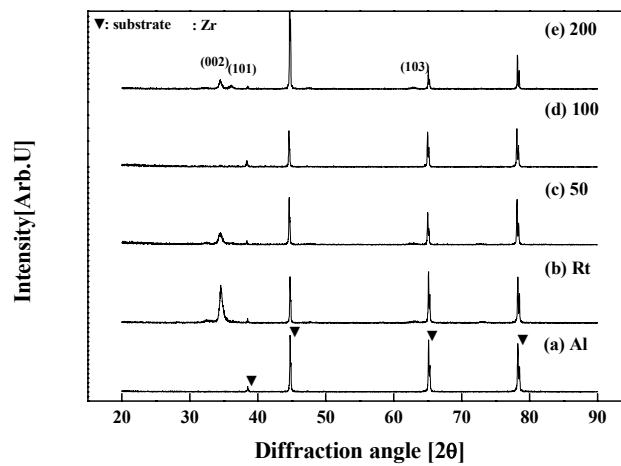


Fig.2 X-Ray diffraction patterns of Zr coating layers with various deposition temperature.



**Fig.3 SEM images of Zr coating layers with various deposition temperature;**  
**(a) Al substrate, (b) room temperature, (c) 50 °C, (d) 100 °C, (e) 200 °C**



**Fig.4 X-Ray diffraction patterns of Zr coating layers with various deposition temperature**  
**by salt spray test.**