Stephen's topic

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Topics

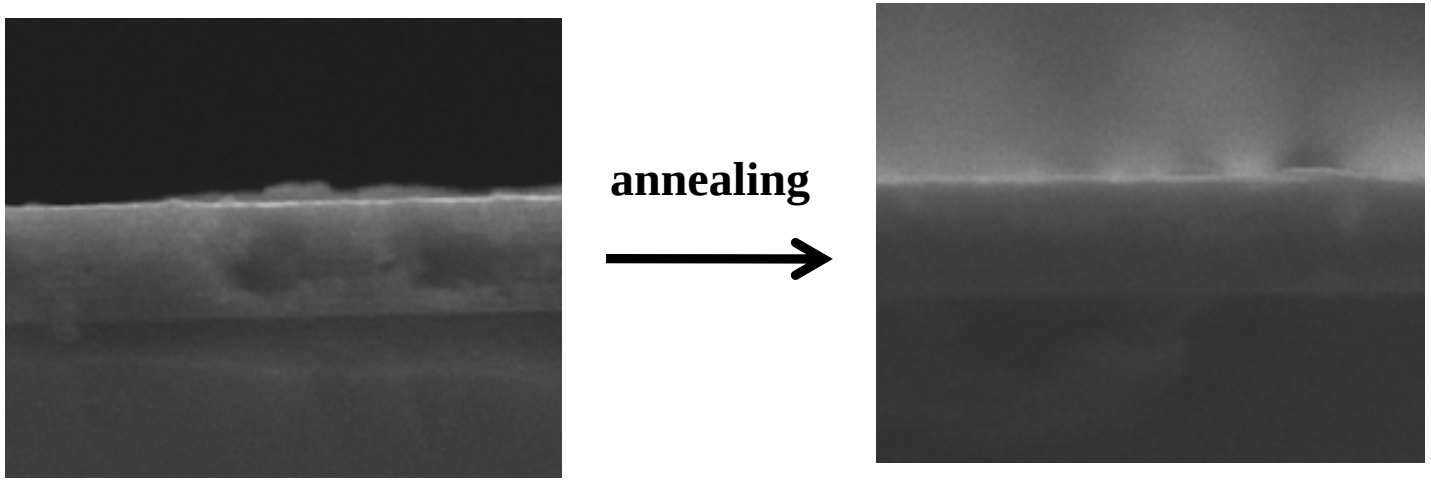
- Thin film metallic glass (TFMG) coatings
- Mechanical properties of TFMGs via nanindentation
- Microstructure of TFMGs
- Structural relaxation of thin films

Interesting topics

- Micro-mechanical properties of TFMGs by lithography process
- Microstructure observation of TFMGs under deformation

Thin film metallic glass (TFMG) coatings

- Annealing of Zr-based multilayer thin films:



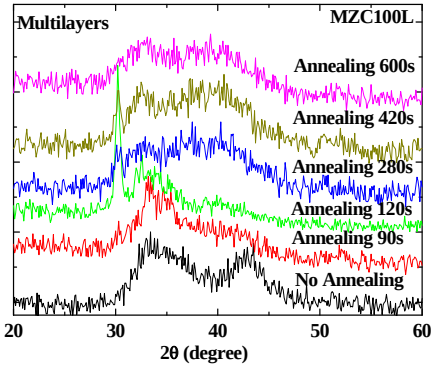
- In bulk

  Zr + Cu $\xrightarrow{\text{annealing}}$ ZrCu compound

  In Zr-Cu multilayer **(Size effect)**

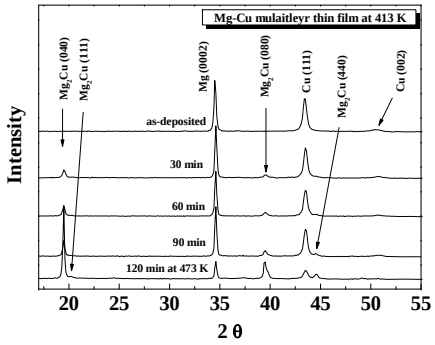
  nanolayer Zr + nanolayer Cu

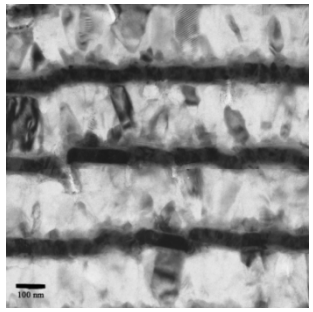
  $\xrightarrow{\text{annealing}}$ metastable Zr-Cu amorphous



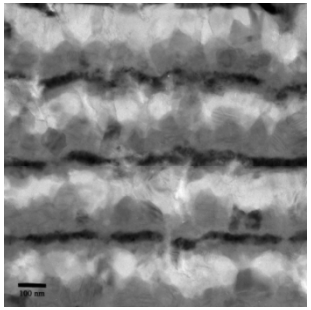
Thin film metallic glass (TFMG) coatings

- Annealing of Mg-based multilayer thin films:





annealing →



- In bulk

  Mg + Cu $\xrightarrow{\text{annealing}}$ Mg_2Cu compound

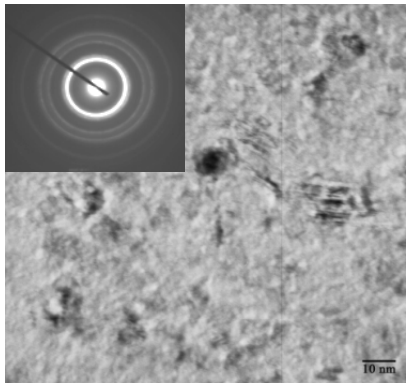
  In Mg-Cu multilayer

  nanolayer Mg + nanolayer Cu $\xrightarrow{\text{annealing}}$ Mg-Mg_2Cu

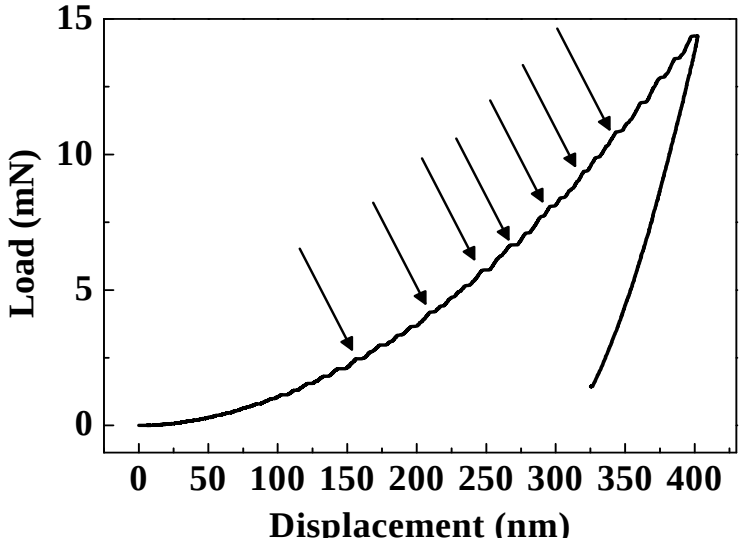
- No metastable amorphous MgCu phase forms during annealing

Thin film metallic glass (TFMG) coatings

- Partial amorphous Mg-based thin film metallic glasses via co-sputtering:
- Co-sputtering can effectly constrain the formation of crystalline phase.

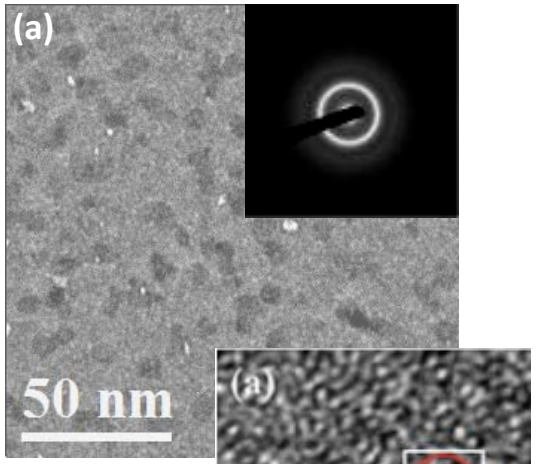


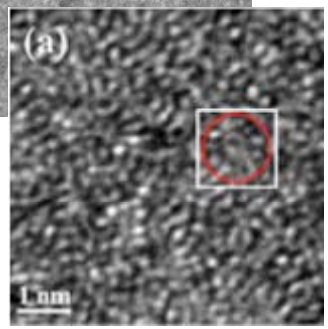
- Through the nanoindentaiton test, the pop-in events show the initiation of shear-transisiton zones.



Structural relaxation of thin films

- Zr-based thin film metallic glasses via co-sputtering:





Annealing