# Article information:

Effect of crystallographic texture and twinning on the corrosion behavior of Mg alloys: A review - ScienceDirect
<https://www.sciencedirect.com/science/article/pii/S2213956721002450?via%3Dihub=>

# Article summary:

1. Magnesium alloys have potential for use as bioresorbable materials, but their poor corrosion resistance limits their practical application.

2. Crystallographic texture and twinning can affect the corrosion behavior of magnesium alloys, with contradictory results depending on the specific conditions.

3. Developing specific crystallographic textures and refining grain size through thermomechanical processing can improve the corrosion resistance of magnesium alloys.

# Article rating:

Appears moderately imbalanced: The article provides some useful information, but is missing several important points or pieces of evidence that would be required to present the discussed topics in a balanced and reliable way. You are encouraged to seek a more balanced perspective on the presented issues by exploring the provided research topics and looking at different information sources.

# Article analysis:

The article "Effect of crystallographic texture and twinning on the corrosion behavior of Mg alloys: A review" provides a comprehensive summary of the effects of crystallographic texture and twinning on the corrosion behavior of magnesium (Mg) alloys. The article highlights the importance of improving the corrosion resistance of Mg alloys for bio-applications, such as using different coatings, alloying, and modifying microstructural parameters like grain size and crystallographic texture.

The article presents contradictory results concerning the effect of twinning on the corrosion behavior. While some experiments show that twins produce more protective films than in the surrounding matrix, in other cases, twinning may provide preferential sites for corrosion due to higher energies of atoms located in twin regions compared to normal atomic positions in the crystalline lattice. The article also discusses how theoretically basal planes should exhibit a lower corrosion rate but in some cases, different results may take place when there is a galvanic effect or when corrosion films control overall corrosion behavior.

The article provides background information on texture development in Mg alloys after plastic deformation using processes such as rolling, extrusion, and severe plastic deformation techniques. It highlights that depending on the mode of plastic deformation and dominant slip system, special textures develop in Mg and Mg alloys.

However, there are several limitations to this article. Firstly, it does not provide enough evidence to support its claims about the effects of crystallographic texture and twinning on the corrosion behavior of Mg alloys. Secondly, it does not explore counterarguments or present both sides equally. Thirdly, it lacks information about possible risks associated with using Mg alloys for bio-applications.

Moreover, there is a potential bias towards promoting Mg alloys for bio-applications without considering their limitations fully. The article emphasizes that poor corrosion resistance remains an unsolved issue limiting their application but fails to mention other limitations such as low yield strength or fast degradation rates.

In conclusion, while this article provides a comprehensive summary of the effects of crystallographic texture and twinning on the corrosion behavior of Mg alloys, it lacks sufficient evidence to support its claims and presents a biased view towards promoting Mg alloys for bio-applications without considering their limitations fully.

# Topics for further research:

* Limitations of using magnesium alloys for bio-applications
* Corrosion mechanisms in magnesium alloys
* Effects of alloying elements on the corrosion behavior of magnesium alloys
* Microstructural modification techniques for improving corrosion resistance in magnesium alloys
* Biocompatibility of magnesium alloys
* Comparison of mechanical properties of magnesium alloys with other biomaterials

# Report location:

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