

**ALEXANDRE SANMARTIN**

INSTITUTE: IAM-WK

SUPERVISOR: DR.-ING. ALEXANDER KAUFFMAN

**(Niobium based alloys) How to stabilize them and utilize them in aerospace industries**

**Description of the topic**

Explanation of the selected topic in form of continuous text.

Due to the more than common phenomena called catastrophic oxidation of refractory metals, specially Nb based alloys, it is necessary to find a way of stabilizing the use of these materials at very high operating temperatures ( $>500^{\circ}\text{C}$ ). With a better workability than Molybdenum, Niobium offers a good alternative for these types of applications. While still under continuous development (i.e.:p C-103), Niobium still has an upgrade margin to optimize its capacities. The key attributes that can be used are the relatively low density and the vastly wide range of operation temperatures. How can these conditions be improved with the right alloying material?

(Approx. 150 words)

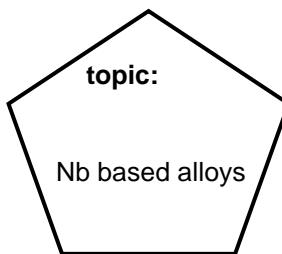
**Structured research question:**

**question or hypothesis**

Can Nb based alloys be improved to reduce and minimize the effects of catastrophic oxidation?

**methodic procedure**

- 1 Literature research about refractory metal based alloys
- 2 Review on current and viable applications and its weaknesses
- 3 Analysis and solution of such weaknesses



**research goal and interest**

Finding possible ways of stabilizing and optimizing Nb based materials

**research tools**

- Previous research papers
- Mentoring sessions
- 

**research subject**

Specifically: effects of different alloying elements and their changing properties

The different possible working environments