Study Year Abroad in Bordeaux

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The University

- The university comprises numerous campuses
- To use public transport, you can obtain a TBM card where you can purchase monthly tickets for a price of £30 as a student
- Crous restaurants offer students a 3-course meal for £3
- Crous halls of residence start from £273
- French evening classes are offered for exchange students
- While lectures are in French, you can choose to attend tutorials held in English



The City

- Famous wine region with many chateaus nearby offering wine tours all year long
- Warmer climate than the UK
- High cost of living compared to the rest of France
- Great restaurants serving seasonal food and traditional French meals
- Called the “little Paris” with striking architectural resemblance to Paris
- Quick and affordable day trips available to places such as St Emillion, Arcachon and Biarritz
- Many local bakeries and markets every Sunday



Research Project

- Synthesised different high entropy alloys (HEAs) using Ti, V, Nb, Al and Fe in different stoichiometric amounts via induction melting using an induction furnace
- Evaluated their hydrogen absorption and desorption capacities using a homemade Sievert-type model conducting at least 3 cycles for each HEA
- Analysed the changes in the phases present (i.e. BCC or FCC) in their structure using powder x-ray diffraction (PXRD) and used EVA software to identify the phases



Results

- $Ti_{25}V_{25}Nb_{25}Fe_{25}$ (named Fe_{25}), $Ti_{25}V_{25}Nb_{15}Fe_{20}Al_{15}$ (named Fe_{20}) and $Ti_{25}V_{25}Nb_{15}Fe_{15}Al_{20}$ (named Fe_{15}) all crystal with BCC, C15 and C14 Laves phases
- Increasing the content of aluminium in the HEAs favoured the formation of BCC as opposed to the Laves phases
- Fe_{20} performed the worst out of the three alloys when their hydrogen storage capacity was evaluated while Fe_{25}, the aluminium free alloy, offered the best hydrogen storage capacity



Conclusion

- All three alloys required high temperatures for their activation
- Fe_{25} alloy delivered a hydrogen storage capacity of around 1.5 wt.% at 200℃
- Fe_{20} and Fe_{15} which delivered a hydrogen storage capacity of around 0.45 wt.% and 0.52 wt.% at 300℃ respectively
- Post activation, Fe_{25}, Fe_{20} and Fe_{15} absorbed hydrogen at room temperature; the hydrogen storage capacity was 0.6 wt.%, 0.3 wt.% and 1% respectively.