Electroless nickel – boron coatings are obtained by chemical aqueous process. This process allows the deposition of continuous coating with a constant thickness on a very large range of substrates. The coatings have a wide range of interesting properties that make them suitable for application in various industries.

**Process of nickel – boron deposits:**
- **Bath:**
  - \( \text{NiCl}_2\cdot 6\text{H}_2\text{O} \)
  - \( \text{NaOH} \)
  - \( (\text{NH}_4\cdot\text{CH}_2) \)
  - \( \text{PbWO}_3 \)
  - \( \text{NaBH}_4 \)
- **Temperature:** 95°C
- **Continuous agitation**

**Type of characterization:**
- **Aspect, morphology and structure:**
  - Optical and SEM observation
  - TEM and electron diffraction
- **Mechanical properties:**
  - Micro–Hardness (Knoop and Vickers)
- **Tribological properties:**
  - Roughness
  - Wear resistance
  - Scratch test
- **Corrosion resistance:**
  - Potentiodynamic polarisation

**Micro-hardness results on sample immersed 60 min:**
- **Vickers:**
  - Load 100 g
  - Surface of the sample
  - Hardness value: 821 ± 56 hv_{100}
- **Knoop:**
  - Load 50 g
  - Cross section of the sample (thickness ~ 20 µm)
  - Hardness value: 750 ± 22 hk_{50}

**Conclusions et perspectives:**
- First, observation of the mechanical properties of the coating confirmed that they possess a very high hardness. Further characterization tests should be conducted to show all properties of coating (morphology, mechanical and tribological properties and corrosion resistance).
- Then, the tests of initiation and growth will be studied to understand the phenomena occurring during the deposit process.
- Finally, electroless nickel-boron deposits will be made on others samples such as:
  - Austenitic, ferritic, martensitic, duplex stainless steel
  - Steel with 0.4% C
  - Cast iron