

**Teleconference Meeting Minutes**

**To:** Mitjan Kalin (Coordinator)

**From:** Muhammad Shahid Arshad

**Date:** 08 Oct 2018

**Time:** 10:00 a.m. to 11:00 a.m.

**Venue:** internet

**Subject:** 3 months Teleconference meeting

<p><b>10.00-10:15</b></p>	<p style="text-align: center;"><b>Opening</b></p> <ul style="list-style-type: none"> <li>- Setup of skype and Introduction to new members of the project Sandra Cruz (IPN) and Hamid Khanmohammadi (NTNU)</li> </ul>
<p><b>10:15-10:45</b></p>	<p><b>IPN</b></p> <ul style="list-style-type: none"> <li>- They have produced W-DLC coatings with HiPIMS method for TINT (will hand over in the NTNU meeting) and they will send samples to NTNU (as soon as possible) for tribocorrosion tests (Wahyu will send them information about the thickness of the samples).</li> <li>- They have prepared and send 6, 12 months report as well as a report on characteristics of the WDLC coatings. They need some feedback on the reports from TINT and NTNU.</li> <li>- Further, they will send a presentation based on characterization of WDLC to TINT, these samples were used in previous tribological studies (prepared with conventional PVD), presentation will based on SEM+EDS (thickness, elemental analysis, interlayer...), hardness (nano-indentation), and roughness (AFM).</li> </ul> <p><b>TINT</b></p> <ul style="list-style-type: none"> <li>- TINT have focused on two work packages WP2 and WP4. In WP4 we have worked on steel and WDLC (prepared with conventional PVD) surfaces and used six different type of additives (ionic liquids) with <b>glycerol</b> as a base oil</li> </ul>

to study the tribotests. Two different temperatures were selected for study 50 C and 100 C. results will be presented in NTNU meeting.

- It is believed that we have some promising results and we can write an article on this. Article will include preparation of WDLC coatings, their characterizations, tribotests and their characterizations (friction, wear, SEM+EDS).
- We have performed neutron reflectometry experiments (WP2) in July. Results need to be analyzed but so far results showed that DLC coatings (WDLC and DLC:h) on Si-blocks were excellent with right thickness and roughness, thanks to Coimbra for good work.
- We need to send the feedback to IPN on reports
- Wahyu asked about the stability of the glycerol and ionic liquids mixtures: we are using ultrasonic finger to homogeneously mix glycerol with ionic liquids and test their stability with turbidimetry test. 1wt% concentration show stable mixture. He also asked about best performing ionic liquids: so far TINT results showed that three ionic liquids seems promising 1. IM (1,3-dimethylimidazolium dimethylphosphate), 2. PP (Tributylmethylphosphonium dimethylphosphate), 3. AM ((2-hydroxyethyl) trimethylammonium dimethylphosphate). However this is ongoing study these conclusion may be different.

#### **NTNU**

- They have performed tribotests with all ionic liquids with different concentrations on steel surface, they have observed promising results from BMP (1-butyl-1-methylpyrrolidinium tris(pentafluoroethyl) trifluorophosphate ([BMP][FAP])) ionic liquid. Results are based on less tribocorrosion which is independent of the ionic liquids concentration.
- They are waiting for WDLC coated samples from IPN which they will receive very soon
- They will send the 6, 12 months report of the project soon

### **WP9 & WP10: Management and Dissemination**

Summary of agreed Actions

<b>10:45-11:00</b>	<ul style="list-style-type: none"><li>- We agreed on the NTNU meeting agenda, we will meet on 22 Nov to have some discuss about the project progress and visit of NTNU labs. Presentations and technical stuff will be discussed on 23 Nov</li><li>- TINT will send signed form from Tajfun company and NTNU from Oilwell Verco to IPN</li><li>- Project flyer is prepared</li></ul>
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