

---

**[PO-C2]Poster Session 2**

Symposium C

Wed. Oct 31, 2018 5:45 PM - 8:00 PM Poster Hall

---

**[P2-20]Temperature dependence of fatigue crack growth in Ti-6Al-4V**

○Bhargavi Rani Anne, Masaki Tanka, Tatsuya Morikawa (Dept. of Materials Science and Engineering, Kyushu University, Japan)

Fatigue properties of dual phase ( $\alpha$ ;+&#x2D; and primary  $\alpha$ ;) Ti-6Al-4V were studied with respect to the range of temperatures and stress intensity range. Fatigue tests were conducted with both high and low stress intensity ranges in the temperature range between room temperature and 550K. Micro crack propagation was observed. Crack growth rate ( $da/dN$ ) was measured where  $a$  is a crack length and  $N$  is a number of cycles, changing temperature. It was found that  $da/dN$  was increased with temperature. It is assumed that  $da/dN$  is the Arrhenius type of equation as it shows temperature dependence. Activation energy calculations were attained from Arrhenius plot between the logarithm of  $da/dN$  and the reciprocal of temperature. The dependence of activation energy on stress intensity range was also obtained, which provides the information on the dislocation mobility controlling the fatigue crack growth. The comparison of fatigue crack growth rate with the temperature dependence of dislocation motion was also studied in detail.