



Figure 10: Raster images of von Mises stress of AA7020/30% TiC composites.

3.2 Fracture behavior

Figure 8 describes the von Mises stress induced in the composites. The von Mises stress decreased with the increase of temperature from -300°C to 0°C and later it increased with the increase of temperature. The von Mises stress was higher in the composites having 30% TiC nanoparticles than that in the composites consisting of 20% TiC. In all composites (figure 9 and 10), the interphase was fractured.

4. Conclusions

The elastic and thermoelastic strains increased with the increase of temperature. The compressive strength decreased with the increase of temperature. Interestingly, the stiffness increased with increase of temperature for AA7020/TiC nanoparticulate metal matrix composites. This might be the reason; TiC is being used as a heat shield coating for atmospheric reentry of spacecrafts.

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