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Palaeo stress analysis using microboudinage structures of tourmaline within metacherts in East Pilbara Terrane

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Granite emplacement is the key process for generation of continental crust during Archaean. We analysed microstructures of tourmaline grains embedded within metacherts in the aureole around the Mount Edgar Granitoid Complex in east Pilbara, Western Australia. The aim of this study is to evaluate stress and strain with respect to progressing deformation in the aureole during the metamorphism in relation to the granite emplacement. The shape preferred orientation of tourmaline grains on the foliation surface revealed that the intensity of lineation depicted by the value of k ranges from 0.6 to 5.4. Higher values of k occur in an area which is previously called sinking zone by several authors. As many tourmaline grains exhibit microboudinage structures, we performed the microboudine analysis for palaeostress analysis. The estimated palaeodifferential stress ranges from 3.9 to 9.2 MPa. The sample with the highest palaeodifferential stress came from the locality <10 m from the contact between the granite and the greenstone belt. The palaeodifferential stress in the sinking zone is 7.2-9.2 MPa, while that far from the contact is 3.9 MPa. We discuss the relationship between the palaeodifferential stress and the k value in the poster.

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