



## **Percolated Single-Crystal Mullite Fibres from Fly Ash: Vitreous Waste Material to High-Performance Refractory**

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Waste materials, such as fly ash and bottom ash, are being produced in increasingly high volumes owing to the dependence of numerous industries on coal-derived electricity. While a small fraction of these materials are used in the construction industry, the large majority is sent to landfill and ponds. Work at UNSW in collaboration with Vecor (Australia) Pty. Ltd. on waste material utilisation has resulted in the development of processing procedures and *in situ* composite materials consisting of percolated and direct-bonded single-crystal mullite fibres. Despite starting with a vitreous material, the products perform as pure mullite, exhibiting outstanding long-term thermal and mechanical stabilities at temperatures >1600°C. The processing, characterisation, analyses, and performance of these materials will be discussed.