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Quality assessment of the melanocratic basalt outcrops for the mineral fiber producing, Southern Urals, Russia

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In recent years, basalt fibers catch the attention of their superior physical and chemical properties in which they rank below only expensive carbon and silicon carbide fibers. The high tensile strength, elastic modulus, durability against environmental factors, acids, and alkalis, long service life, extended operating temperature range, and low hygroscopicity allow basalt fibers to find increasing application in new materials. The suitability of raw for basalt fibers production is determined by the effect of rheological and crystallization properties of basalt melts, higher the ratio of viscosity to surface tension η/σ more stable the formation of fibers, it constrains the mineral and chemical composition of the raw material. An integrated petrographic and mineralogical investigation of melanocratic basalts from the Southern Urals, was carried out to assess the suitability for the production of high quality basalt fibers. The results presented herein confirm as the intense metamorphism and the refractory impurities altered the quality of the row material ant its possibility of producing fine staple and continuous basalt fibers.