Zircon energy Antarctica

Are there detrital zircon ages and trace element compositions in Antarctica?
New detrital zircon age and trace element evidence for 1450 Ma igneous zircon sources in East Antarctica. Precambrian Res. 300, 53-58 (2017). Paulsen, T. et al. Detrital zircon ages and trace element compositions of Permian-Triassic foreland basin strata of the Gondwanide orogen, Antarctica. Geosphere 13, 1-9 (2017).

How many detrital zircons are there in Antarctica?
We carried out a coupled U-Pb age and trace element analysis of 5,715detrital zircons from 46 sandstone samples (primarily Neoproterozoic-early Palaeozoic in age) widely distributed along a ~3,000-km-long swath of the Neoproterozoic-early Palaeozoic Pacific-Gondwana margin in Antarctica (Fig. 1 and Supplementary Fig. 1).

What is a detrital zircon U-Pb & trace element?
Detrital zircon U-Pb and trace element data provide new information on the provenance of Permian-Triassic foreland basin depositsof the Gondwanide orogen that belong to the Beacon Supergroup in Antarctica. Zircon U/Th ratios primarily point to dominantly igneous parent rocks with subordinate contributions from metamorphic sources.

How is zircon ablated?
The analyses involve ablation of zircon with a 193 nm ASI Resolution 155 ArF excimer laserusing a spot diameter of 29 µm,under a 100% He atmosphere. The ablated material is carried by an He-Ar mixture to the plasma source of a Thermo Element XR magnetic sector ICP-MS equipped with a triple detector (pulse counter,analogue and Faraday cup).

Where did the zircon age come from?
The sources of this zircon age population may include exposed and ice-covered igneous provinces in Antarctica,such as the Ross orogen 18,19,20,for example,as well as interior areas of Gondwana such as the East African orogen 21.

Do igneous zircons have trace elements?
Trace elements were measured using the same LA-ICP-MS instrument in an effort to determine the source rock provenance of the igneous zircons. Laser spots typically reoccupied the same spot location for the U-Pb age analyses for the majority of the new data reported here.

Major Antarctic glaciation initiated at the Eocene-Oligocene transition ~34 million years ago (Ma), marking one of the most pronounced climate transitions of Phanerozoic times ().The reconstruction of Antarctica"s paleoenvironmental and paleotectonic conditions before this transition, i.e., in the middle to late Eocene, provides important boundary conditions for ...

Detrital zircon studies on upper Neoproterozoic and Cambrian strata in the same region (Goodge et al., 2002, Goodge et al., 2004b) have provided data on age provinces eroded at that time.Additionally, studies on metamorphic and igneous clasts in modern glacial tills, collected from CTM, and derived from the craton have provided further data on sub-glacial ...

tion of zircon is used to refine the U-Pb geochronology of the Archaean, ultra-high temperature Napier Com-plex, east Antarctica. Scanning electron microscope characterisation of zircon ...

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Transporting fuel and oil to Antarctica is a costly and sometimes risky exercise. Before the introduction of renewable energy systems, Australian stations required 2.1 megalitres of diesel fuel every year for power and heating. Burning this fuel emitted around 5,500 tonnes of carbon dioxide into the Antarctic environment.

The aim of this study is to (i) demonstrate the feasibility and potential of the triple-dating approach for provenance studies, (ii) elucidate the provenance of zircon that may point ...

Detrital zircon U-Pb and trace element data provide new information on the provenance of Permian-Triassic foreland basin deposits of the Gondwanide orogen that belong to the Beacon Supergroup in Antarctica. Zircon U/Th ratios primarily point to dominantly igneous parent rocks with subordinate contributions from metamorphic sources.

The responsiveness of zircon to granulite metamorphism and post-peak fluid infiltration in polymetamorphic terranes has been investigated utilising a case study from the Rauer Islands of East Antarctica.Imaging (BSE, CL), textural analysis, in-situ ion microprobe trace element analysis of zircon, garnet, orthopyroxene, plagioclase and apatite, and ion microprobe ...

The composite detrital zircon age spectrum, derived from a total of 468 concordant (<± 5% discordant) U-Pb zircon analyses from the three samples, indicates sedimentary source regions dominated by c. 1600-1470 Ma (48% of total) and c. 1180 Ma zircons (34%), with a lower proportion of zircons in the age range from c. 2400 Ma to 1700 Ma (18% ...

Keywords: Detrital zircon ages, LA-ICP-MS zircon U-Pb dating, Sør Rondane Mountains, East Antarctica INTRODUCTION Gondwana supercontinent has mainly two tectonic mod-els for the reconstructions with the orogenic belts defined as the East African Orogen and Kuunga Orogen (Meert, 2003) or the East Africa Antarctica Orogen (EAAO: e.g.,

East Antarctica Australia India Africa NVL QMM SVL African-Antarctic orogen -550 Ma -500 Ma

1090-1030 Ma 130 Ma 990-900 Ma nd Miller Range Gamburtsev ial Mts. 590-480 Ma 1000 km Formation Antarctica) Ross Supergroup CTAM A B Cambrian-Ordovician.48 Ga n 0 orogenic belt t 3.0-1.6 Ga mobile belt Permian-Triassic Back-arc Early Triassic ...

Request PDF | On Apr 1, 2018, Sameer Ranjan and others published Zircon geochronology of deformed alkaline rocks along the Eastern Ghats Belt margin: India-Antarctica connection and the Enderbia ...

Zircon, a highly refractory mineral, can survive in a variety of magmatic, metamorphic, and sedimentary environments. As a result, it plays a pivotal role in elucidating the origin of geological features and the evolution of the Earth"s crust (Belousova et al., 2010).Generally, zircon crystals incorporated from the surrounding host rocks during magma ...

sin in the light of new and existing detrital-zircon geochronologic data. Specifi-cally, this paper records new detrital-zircon data for nine sandstones and inter-prets the results in terms of the evolution of the basin and the source regions. An initial program of detrital-zircon geochronology (Elliot and Fanning, 2008)

High-grade gneisses from Mt. Riiser-Larsen, East Antarctica, have been dated by whole-rock-mineral Sm-Nd and SHRIMP zircon and monazite U-Pb to help define the thermal history of ultrahigh temperature (UHT)metamorphism in the Napier Complex. Both the monazite and youngest zircon yield a range of apparent ages (~2.51-2.47 Ga),

Mountains, Antarctica: Zircon geochronology, provenance, and basin evolution ... zircon and garnet, lesser opaques, and rare tourmaline. Carbonaceous shreds are scattered. Matrix of phyllosilicate shreds and some secondary silica.. 07-2-12. Lower Buckley Formation, Mt. Rosenwald. Sixty four meters above the base of the formation.

Comparative analysis of detrital zircon age populations indicates that inboard stratigraphic successions (Wilson Terrane) and those located outboard of the East Antarctic craton (the Bowers and ...

The Neoproterozoic East African - Antarctic Orogen, which is exposed mainly in East Africa, Madagascar, Southern India, Sri Lanka, and East Antarctica, has been regarded as one of the largest orogenic belts through the Earth"s history (e.g., Collins et al., 2007a, Jacobs and Thomas, 2004, Meert, 2003, Meert and Lieberman, 2008, Santosh et al., 2009b, Santosh ...

Casey solar farm. The first Australian solar farm in Antarctica was switched on at Casey research station in March 2019. The system of 105 solar panels, mounted on the northern wall of the "green store", provides 30 kW of renewable energy into the power grid.

Antarctica, large amounts of felsic to mafic plutonic rocks, known as the Granite Harbour Intrusive complex (GHI) (Gunn and Warren, 1962), were emplaced during the ... and zircon U-Pb dating as well as Hf isotopes ratios on two samples (N=2, n=40), from the ...

Pb-diffusion in the pristine zircon lattice is insignificant up to temperatures of at least 1000 °C. Pb-loss is only possible if the zircons experienced a time interval below their annealing temperature of about 600-650 °C, because only below this temperature can the lattice damage through a-decay and spontaneous fission accumulate. ...

East Antarctica, one sample at the mouth of Scott Glacier, and from beneath three West Antarctic ice streams. The Ross/Pan-African U/Pb population is ubiquitous in these Antarctic tills and many Beacon Supergroup sandstones, thus 83 grains were analyzed for ZHe to subdivide this population. Two ZHe age populations are evident in East Antarctic

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of monazite, xenotime and zircon from the Archean Napier Complex, East Antarctica: evidence for ultra-high-temperature metamorphism at 2400 Ma: Precambrian Research, v. 114, n. 3-4, p. 249 -275,

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