

COLORADO GEOLOGICAL SURVEY

ON-004-04D

Data tables of detrital zircon U-Pb geochronologic analyses and trace element concentrations of select Cretaceous, Paleogene, and Neogene rocks, Denver Basin and Northeastern Colorado (Data) - V20231110

CITATION

Morgan, Matthew L., and Michael K. O’Keeffe. “ON-004-04D Data Tables of Detrital Zircon U-Pb Geochronologic Analyses and Trace Element Concentrations of Select Cretaceous, Paleogene, and Neogene Rocks, Denver Basin and Northeastern Colorado (Data) - V20231110.” Detrital Zircon Analyses. Golden, CO: Colorado Geological Survey, November 10, 2023. <https://doi.org/10.58783/cgs.on00404d.icwa5545>. CGS Publications. <https://coloradogeologicalsurvey.org/publications/front-range-detrital-zircon/>.

PURPOSE

The Colorado Geological Survey (CGS) collects and evaluates isotopic age data for detrital zircon grains to estimate the ages of rock units and sediment sources for use in mineral resource evaluations, fault investigations, hydrologic unit studies, geologic mapping, and to enhance general geologic knowledge. The data tables provided here are for informational purposes. They contain values that are output from the laboratory and have not been modified or analyzed.

SAMPLE SITES AND COLLECTION

CGS geologists visited multiple sites within the Denver Basin and northeastern Colorado to collect samples for detrital zircon age-dating analyses. Target units were chosen based on lack of published ages, use within CGS projects, and access. A total of ten samples were obtained from the following rock units (see the location spreadsheets for latitude/longitude coordinates): Fox Hills Sandstone (“Titanium Ridge” and Rooney Road), Laramie Formation (Colorado School of Mines Campus), Arapahoe Conglomerate (Alameda Parkway/C-470), White River Formation (North Sterling Reservoir), Castle Rock Conglomerate (Castlewood Canyon, Douglas County), and Ogallala Formation (Cedar Point near Limon).

At each location, a minimum of 500 grams of sample were collected directly from the outcrop using a rock hammer. Samples were placed within 1-gallon low-density polyethylene bags and shipped to the Isotope Geology Laboratory at Boise State University who conducted the analyses.

HOW TO USE THIS ZIP FILE

To open the compressed (.zip) file that you downloaded, double-click on the file. Inside the folder labeled ON-004-04D, there are a number of files and folders. Some files are stored in Adobe Portable Document (.pdf) format, others are Excel spreadsheets (.xlsx).

HOW TO IDENTIFY AND VIEW FILES

REPORT DOCUMENTS

- **ON-004-04D-Read_Me.pdf**

This file

- **ON-004-04-v20231110-DZ-sample-locations.xlsx**
XLSX spreadsheet containing sample name, rock/sediment type, sample description, other name (geologic map unit label), location of samples (lat/long), elevation (m), feature type, country, state, county, collector name and address
- **Morgan et al. - 2023 - Detrital Zircon Age Estimates.pdf**
Abstract of GSA conference paper presenting these results (see REFERENCE below)
- **ON-004-04D-DZ_Data folder**
Within each directory beginning with "DZ" there are multiple files labeled as follows:
 - **[Formation]-DZ-Report** – *XLSX spreadsheet for each sample location including sample data; instrumental data; metadata; and standard data tables in Excel format*
 - **[Formation]- CL-Images** – *PDF of initial cathodoluminescence images of selected zircon grains paired with image with markup numbers indicated*

NOTE: *If there are multiple samples from a location there may be separate directories for specific locations.*

To view files

If you don't already have Adobe Reader installed on your device, visit <https://get.adobe.com/reader/> to download a free version of the software. Then, start Adobe Reader and choose "File," "Open," and locate the .pdf files where you downloaded them, they will open in Adobe Reader.

Microsoft Excel or the open-source equivalent LibreOffice will open the .xlsx files.

REFERENCE

Morgan, M.L., O'Keeffe, M.K., Mahatma, A.A., Keller, S.M., 2023, Detrital Zircon Age Estimates of Select Upper Cretaceous and Neogene Sedimentary Rocks, Denver Basin and Northeastern Colorado: Geological Society of America Abstracts with Programs, vol. 55, no. 5, <https://gsa.confex.com/gsa/2023RM/meetingapp.cgi/Paper/387863>

DISCLAIMER

The Colorado Geological Survey (CGS) is pleased to provide access to this data as part of our commitment to advancing geological research and promoting scientific understanding. Before utilizing this data, please take a moment to read and understand the following disclaimer, which outlines important information regarding the use and limitations of the geochronology data as released by the CGS.

Data Accuracy and Validity

The data provided by CGS has been collected and processed by professional geologists. However, it is imperative to recognize that geochronological methods and techniques are subject to inherent limitations and uncertainties. CGS cannot guarantee the absolute accuracy or completeness of the data, and users are encouraged to exercise discretion when interpreting and utilizing the information.

Data Source and Attribution

Users are expected to acknowledge the source of the geochronology data in any publications, reports, or presentations that make use of this information. Proper attribution to the Colorado Geological Survey is essential to maintain the integrity of the data.

Data Availability

CGS makes every effort to provide geochronology data that is current and up to date. However, data availability may change over time due to ongoing research, updates, or corrections. Users are encouraged to consult CGS's website or contact us directly for the most recent data releases and updates.

Liability and Indemnification

By accessing and using the data provided by CGS, users agree to release CGS from any liability, including but not limited to, any losses, damages, or claims arising from the use of the data. Users are responsible for conducting their own due diligence and risk assessment.

Quality Control and Interpretation

Geochronologic data often require specialized knowledge for proper interpretation. Users should possess a sound understanding of geochronological techniques and geological principles to effectively use the data. CGS is not responsible for any misinterpretation or misapplication of the data.

Updates and Revisions

CGS may periodically update or revise the geochronology data as new information becomes available or errors are identified. Users are encouraged to check for updates and revisions regularly. Newer versions will include the year-month-day indicating when they were published.

Access

By accessing and using the geochronology data provided by CGS, you acknowledge that you have read, understood, and agreed to abide by the terms and conditions outlined in this disclaimer.

For inquiries, clarification, or additional information related to this data, please contact:

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