



Chapter 1

Titles



1.1 Grammatical Constructions in Titles

Generally, there are four types of grammatical constructions in titles, including full-sentence, nominal group, compound, and question constructions (Hartley, 2008). The titles of most research papers in geoscience are either nominal group constructions or compound constructions. Among the following 50 titles, 26 are in nominal group constructions, and 14 in compound constructions.

A. Full-sentence constructions

- * *Mg–O isotopes trace the origin of Mg-rich fluids in the deeply subducted continental crust of Western Alps*
- * *Weak bedrock allows north-south elongation of channels in semi-arid landscapes*
- * *Lateral H₂O variation in the Zealandia lithospheric mantle controls orogen width*
- * *Deformation of mantle pyroxenites provides clues to geodynamic processes in subduction zones: Case study of the Cabo Ortegal Complex, Spain*
- * *Understanding sea-level change is impossible without both insights from paleo studies and working across disciplines*

B. Nominal group constructions

- * *Estimates of olivine-basaltic melt electrical conductivity using a digital rock physics approach*
- * *Formation timescales of CV chondrites from component specific Hf–W systematics*
- * *Glacier velocity variability due to rain-induced sliding and cavity formation*
- * *A new boron isotope-pH calibration for *Orbulina universa*, with implications for understanding and accounting for “vital effects”*
- * *Abrupt plant physiological changes in southern New Zealand at the termination of the Mi-1 event reflect shifts in hydroclimate and pCO₂*
- * *Cosmogenic ²²Na as a steady-state tracer of solute transport and water age in first-order catchments*
- * *Creep strength of ringwoodite measured at pressure-temperature conditions of the lower part of the mantle transition zone using a deformation-DIA apparatus*
- * *Eastern Indian Ocean microcontinent formation driven by plate motion changes*
- * *Influence of the Amazon River on the Nd isotope composition of deep water in the western equatorial Atlantic during the Oligocene–Miocene transition*
- * *The effects of magmatic processes and crustal recycling on the molybdenum stable*

isotopic composition of Mid-Ocean Ridge Basalts

- * *Two-phase deformation of lower mantle mineral analogs*
- * *Complementary element relationships between chondrules and matrix in Rumuruti chondrites*
- * *Continental climate gradients in North America and Western Eurasia before and after the closure of the Central American Seaway*
- * *Evidence for a dynamic East Antarctic ice sheet during the mid-Miocene climate transition*
- * *Hinterland drainage closure and lake formation in response to Middle Eocene Farallon slab removal, Nevada, U.S.A.*
- * *Immediate propagation of deglacial environmental change to deep-marine turbidite systems along the Chile convergent margin*
- * *Seasonal variations in dissolved neodymium isotope composition in the Bay of Bengal*
- * *Slow fault propagation in serpentinite under conditions of high pore fluid pressure*
- * *The neodymium stable isotope composition of the silicate Earth and chondrites*
- * *Changes in the occurrence of extreme precipitation events at the Paleocene–Eocene thermal maximum*
- * *Timescale of overturn in a magma ocean cumulate*
- * *Thermal-chemical conditions of the North China Mesozoic lithospheric mantle and implication for the lithospheric thinning of cratons*
- * *Testing Late Cretaceous astronomical solutions in a 15-million-year astrochronologic record from North America*
- * *Surface and subsurface hydrology of debris-covered Khumbu Glacier, Nepal, revealed by dye tracing*
- * *Predicted diurnal variation of the deuterium to hydrogen ratio in water at the surface of Mars caused by mass exchange with the regolith*
- * *Magma interactions, crystal mush formation, timescales, and unrest during caldera collapse and lateral eruption at ocean island basaltic volcanoes (Piton de la Fournaise, la Réunion)*

C. Compound constructions

- * *Cenozoic paleoaltimetry of the SE margin of the Tibetan Plateau: Constraints on the tectonic evolution of the region*
- * *Linking subsurface to surface degassing at active volcanoes: A thermodynamic model with applications to Erebus volcano*
- * *Lu–Hf geochronology on cm-sized garnets using microsampling: New constraints*

on garnet growth rates and duration of metamorphism during continental collision (Menderes Massif, Turkey)

- * *Conodont (U–Th)/He thermochronology: A case study from the Illinois Basin*
- * *Absence of thermal influence from the African Superswell and cratonic keels on the mantle transition zone beneath southern Africa: Evidence from receiver function imaging*
- * *Dissolved and particulate ^{230}Th – ^{232}Th in the Central Equatorial Pacific Ocean: Evidence for far-field transport of the East Pacific Rise hydrothermal plume*
- * *River network evolution as a major control for orogenic exhumation: Case study from the western Tibetan Plateau*
- * *Exhumation history of the West Kunlun Mountains, northwestern Tibet: Evidence for a long-lived, rejuvenated orogen*
- * *P-wave velocity structure beneath Mt. Melbourne in northern Victoria Land, Antarctica: Evidence of partial melting and volcanic magma sources*
- * *Active fault system across the oceanic lithosphere of the Mozambique Channel: Implications for the Nubia-Somalia southern plate boundary*
- * *Constraints on the timing and duration of orogenic events by combined Lu–Hf and Sm–Nd geochronology: An example from the Grenville orogeny*
- * *Geomorphic evidence for the geometry and slip rate of a young, low-angle thrust fault: Implications for hazard assessment and fault interaction in complex tectonic environments*
- * *The influence of seawater calcium ions on coral calcification mechanisms: Constraints from boron and carbon isotopes and B/Ca ratios in *Pocillopora damicornis**
- * *Melting experiments on the Fe–C binary system up to 255 GPa: Constraints on the carbon content in the Earth's core*

D. Question constructions

- * *How do machine learning techniques help in increasing accuracy of landslide susceptibility maps?*
- * *Simulating rotating fluid bodies: When is vorticity generation via density-stratification important?*
- * *Rupture speed and slip velocity: What can we learn from simulated earthquakes?*
- * *A ~9 Myr cycle in Cenozoic $\delta^{13}\text{C}$ record and long-term orbital eccentricity modulation: Is there a link?*
- * *Epeirogeny or eustasy? Paleozoic–Mesozoic vertical motion of the North American continental interior from thermochronometry and implications for mantle dynamics*

Based on the above 50 titles, some tips on how to write a good title can be summarized. Firstly, you should be cautious with using articles and prepositions. Titles rarely begin with the article “the”. In the titles listed above, only three of them begin with “the”, i.e., “The effects of magmatic processes and crustal recycling on the molybdenum stable isotopic composition of Mid-Ocean Ridge Basalts”, “The neodymium stable isotope composition of the silicate Earth and chondrites”, and “The influence of seawater calcium ions on coral calcification mechanisms: Constraints from boron and carbon isotopes and B/Ca ratios in *Pocillopora damicornis*”. Also, prepositional phrases are widely used in titles, so make sure that you use prepositions correctly.

Secondly, you are not allowed to use full stops in titles. None of the above titles contains a full stop, even though some of them are full sentences. A compound construction title consists of two parts which are separated by a colon, and the first letter of the first word in the second part should be capitalized, even if the first word is an indefinite article, such as “Constraints on the timing and duration of orogenic events by combined Lu–Hf and Sm–Nd geochronology: An example from the Grenville orogeny”.

Lastly, you should use modifiers properly. In the titles listed above, before or after a noun or a noun phrase, there are often some modifiers. They can either be prepositional phrases, such as “in subduction zones”, “during the Oligocene–Miocene transition”, and “before and after the closure of the Central American Seaway”, or non-finite verbs, including “using a deformation-DIA apparatus”, “using a digital rock physics approach”, and “caused by mass exchange with the regolith”. Using modifiers properly can make titles informative, specific, and distinctive, as they can reveal the site of your research or the novel method used in your research. Editors and readers will not be attracted by titles that are too general or do not convey any intriguing information.

➤ 1.2 Using Prepositions Properly

In this part, types of prepositions, functions of prepositional phrases, and collocations containing prepositions are introduced to help writers of research papers have a better understanding of how to use prepositions properly.

➤ 1.2.1 Types of Prepositions

A. Simple prepositions, such as “about”, “at”, “through”, “of”, “since”, etc.

■ * Although linear increases *of* ²³⁰Th concentrations *with* depth are observed *at* both *of*

our sites **from about** 0 to 2,000 m, ...

- * Cyclic voltammograms (CVs) were performed **in** an N_2 -saturated 2mM Fe(II) solution amended **with** 1mM **of** the various Me(II) **at** room temperature **at** a scan rate **of** 50 mV/s.
- * Open system melt generation **within** a short time period would have had to be followed **by** focused channeling **of** the extracted mantle-derived melts **through** a crustal conduit.
- * Temperature profiles were taken **with** a thermistor probe near the deepest point **in** each lake, and several measurements **within** the metalimnion **of** the stratified lakes allowed precise calculation **of** the depth **of** the thermocline—taken **as** the plane **of** the maximum rate **of** decrease **in** temperature.
- * The next step was to filter the correlograms to enhance the signal-to-noise ratio **by** applying a singular value decomposition-based Wiener filter.

B. Compound prepositions, such as “into”, “onto”, etc.

- * The combined effect of wider and faster propagating dykes allows greater volumes of magma to flow **into** the host rock surrounding the magma chamber.
- * The recovered rare earth fraction was dried down, redissolved in 0.18 M HCl, and loaded **onto** a second cation exchange column containing 0.6 mL of Eichrom™ LN spec resin of particle size 50 μm to 100 μm .

C. Double prepositions, such as “until after”, “from among”, etc.

- * No tornado warning was issued **until after** the tornado lifted.
- * We have chosen NRI **from among** the several available metrics for phylogenetic diversity.

D. Phrasal prepositions, such as “according to”, “because of”, “in spite of”, etc.

- * Grayscale subvolumes were processed **according to** the procedure detailed in Miller et al. (2014) to remove noise and artifacts, improving the efficacy of automatic segmentation algorithms.
- * Dust affects the planet's radiative balance **because of** its role in the albedo.
- * **In spite of** the fact that Maori and Pacific movers have an equal number of UZs with high CVD rates in the Q4 highly deprived quartile, the geography of CVD for Pacific movers reveals very different patterns than those observed among Maori.

E. Participle prepositions, such as “regarding”, “concerning”, “including”, “given”, etc.

- * We thank G. Gaetani and E. Sarafian from Woods Hole Oceanographic Institution (WHOI) for their insight **regarding** water content in mantle minerals and melts.

- * Unfortunately, data **concerning** the interactions of all species modeled in this work does not exist at relevant P – T conditions.
- * The model considers all possible sources of fluid from multiple depths, **including** degassing of dissolved volatiles during crystallization and/or decompression.
- * This is unlikely **given** that only a few percent of Hypatia is non-carbonaceous material.

➤ 1.2.2 Functions of Prepositional Phrases

In academic writing, a prepositional phrase is frequently used as an attribute or adverbial. Some examples are shown below.

A. Used as an attribute

- * Cores were imaged using a combination of absorption-contrast and phase-contrast X-ray μ -CT at 27 keV to resolve the small density contrast **between olivine and basaltic glass**.
- * An open-flow gas exchange system (LI-6800, LI-COR, U.S.A.) was used to measure leaf gas exchange in the newest fully expanded flag leaf **at the filling stage**.

B. Used as an adverbial

- * **With the enforcement of** the projects of agricultural land retrieval to forest and grassland, a large area of farmland would be restored to grasslands or forests.
- * **In the Transantarctic Mountains**, the Ferrar is intruded into the mostly terrestrial Devonian to Triassic sedimentary deposits of the Beacon Supergroup.

➤ 1.2.3 Collocations Containing Prepositions

Writers are advised to acquire collocations containing prepositions and use them correctly in academic writing. Some examples are shown below.

A. Preposition + noun + preposition

- * However, the resulting succession of laminated crusts (thick red layer **at the bottom of** the snowpack in Fig. 7) was easily observable during field campaigns throughout the season.

B. Verb + preposition

- * All of these models **focus on** constraining chemical equilibrium between a single melt and fluid.

C. Adjective + preposition

- * *The result of the model run is a list of possible combinations of gases and their proportions that, when combined, are **equal to** the composition of gas measured at the surface.*

You can use online corpora to confirm the correctness and accuracy of the collocations used in your academic papers when you are not sure about their usages. Some corpora are recommended such as SKELL, Corpus of Contemporary American English (COCA), Just the Word, etc. Do not coin strange collocations that are not accepted by native English speakers.

1.3 Using the Definite Article “the” Properly

It is not easy for writers to use the definite article “the” in scientific writing. How to use it will be introduced in this part. Generally speaking, “the” can be used to refer to the following five aspects.

A. Something mentioned in the preceding sentence

- * *In Nancy, noble gases and **nitrogen** were extracted conjointly in samples H-N₁, H-N₂, and H-N₃ upon heating in high-vacuum with an infra-red (IR) CO₂ laser...**The nitrogen** was purified in a glass line.*
- * *In Paris, the nitrogen content and isotope composition of **two Hypatia diamond samples** were investigated...**The two samples** were weighed before their analysis.*

B. A particular area

- * *...such as **the Kuiper Belt**, where presolar components might be more abundant.*
- * *...**in the southwestern side** of the Libyan Desert Glass strewn field.*
- * *...**in the Central Equatorial Pacific Ocean** (~155°W–159°W) at two sites.*
- * ***the** Batavia and Gulden Draak microcontinents*
- * ***the** Perth Abyssal Plain*
- * ***the** Asteroid Belt*
- * ***the** Sahara*
- * ***the** Persian Gulf*
- * ***the** Black Forest*
- * ***the** Iberian Peninsula*

C. Something unique

- * *the Pacific*
- * *the Earth*
- * *the equator*
- * *the Nile*
- * *the North Pole*

D. A particular noun/method/pattern/model

- * *the lattice parameter refined from the X-ray diffraction pattern*
- * *the $^3\text{He}/^4\text{He}$ ratios*
- * *the model calculations by Leya & Masarik (2009)*

E. A nominalization

- * *the presence of contaminants and important amounts of water*
- * *the release of some atmospheric Ne*
- * *the right side of pure potential end-members*
- * *the addition of some cosmogenic ^3He*
- * *the isotopic spectra of Xe*

Remember, do not use “the” before: (1) names of continents, such as Asia, Africa, etc.; (2) names of most countries/territories, such as Japan, Mexico, Singapore, except for the Netherlands, the United States, etc.; (3) names of cities, towns, or states, such as Tokyo, New York, Miami; (4) names of lakes and bays, such as Lake Titicaca, Lake Tanganyika, except for a group of lakes like the Great Lakes; (5) names of mountains, such as Mount Qomolangma, Mount Fuji, except for the ranges of mountains like the Rockies; and (6) names of islands, such as Isles of Scilly, except for the island chains like the Aleutians.



Exercises

I. Fill in the following blanks with appropriate prepositions.

1. Glacier longitudinal profiles _____ regions of active uplift
2. Constraints _____ crystal storage timescales in mixed magmas: Uranium-series disequilibria in plagioclase from Holocene magmas at Mount Hood, Oregon
3. A new hydrothermal scenario _____ the 2006 Lusi eruption, Indonesia: Insights from gas geochemistry
4. Waveform tomography imaging _____ a megasplay fault system in the seismogenic Nankai subduction zone
5. Spin transition _____ ferric iron in Al-bearing Mg-perovskite up to 200 GPa and its implication _____ the lower mantle
6. _____ 2012–2014, we measured Na and ^{22}Na in precipitation _____ Williamsburg, which is on the Coastal Plain geologic province of Virginia.
7. Five-liter samples _____ varying depths (24.5–4,601m) were collected.
8. Each Cubitainer was rinsed with trace metal grade acid (10% HCl), cleaned three times _____ Milli-Q water, air-dried in a laminar airflow hood and stored separately inside the clean laboratory of the R.
9. Voxel (3D pixel) values in the reconstructed images roughly correspond _____ material density.
10. Samples often exhibit significant decompression cracking. These cracks are voids that are not present _____ elevated pressure and temperature.

II. Fill in the following blanks with correct articles or zero article.

Paragraph One

^{230}Th ($t_{1/2} = 75.69$ kyr) is widely used as 1. _____ quantitative marine geochemical tracer due to its highly reactive chemical behavior. It is produced by 2. _____ radioactive decay of ^{234}U , which is conservative in seawater and has a long residence time (~200