

THE EXERGOECOLOGY PORTAL

<http://www.exergoecology.com>

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What is it



- The exergoecology portal is the first scientific web space devoted to the novel discipline *Exergoecology*.
- *Exergoecology* is the application of the exergy analysis in the evaluation of natural fluxes and resources on earth.
- It is free and its aim is to disseminate the ideas of exergy and nat. resources to all interested audience.
- Developed by CIRCE (Spain) with collaboration of ITC (Poland).

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What does it contain



- Information about exergoecology:
 - Exergy as ecological indicator
 - The reference environment
 - Exergy costs
 - Thermoecological costs...
- An online chemical exergy calculator
- A bibliography database with all relevant references on exergy and natural resources.

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The Exergoecology Portal

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Welcome to the exergoecology Portal

This portal is the first scientific web space devoted to the dissemination of the novel discipline "Exergoecology"

What you will find...

Information about Exergoecology

Answers to what is Exergoecology, the Reference Environment, Thermoecological costs and Exergy Costs.



Exergy calculator

The first online chemical exergy calculator. It calculates automatically the exergy of near 2000 inorganic substances just by entering the formula!



Bibliography

All relevant bibliography dealing with natural resources and exergy ready to be downloaded as a ".bib" file for LaTeX users.



News

[Release of the exergoecology portal](#)
2005-11-28

[More...](#)

Upcoming Events

[ECOS 2006](#)
Capsis Hotel, Aghia Pelagia, Crete, Greece, 2006-07-12

[BIENNIAL INTERNATIONAL WORKSHOP. ADVANCES IN ENERGY STUDIES.](#)
PORTO VENERE, SP, Italy, 2006-09-12

[ASME 2006](#)
Chicago, Illinois, 2006-11-05

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Information about exergoecology:

- Short descriptions of the theory related to exergy and resources.

Exergoecology

What is exergoecology?



Exergoecology is the application of the exergy analysis in the evaluation of natural fluxes and resources on earth. The consumption of natural resources implies destruction of organized systems and dispersion, which is in fact generation of entropy or exergy destruction. This is why the exergy analysis can describe perfectly the degradation of natural capital.

The thermodynamic value of a natural resource could be defined as the minimum work (exergy) needed to produce it with a specific composition and concentration from common materials or reference substances in the Reference Environment.

Therefore exergy can account for the concrete physical characteristics which make natural resources valuable: a particular composition, which differentiates them from the surrounding environment, and a distribution which places them in a specific concentration. Hence, quantifying natural capital in terms of exergy is more rigorous, coherent and comprehensive than with mass or money. [Read more...](#)

The Reference Environment

The exergy of a system gives an idea of its evolution potential for not being in thermodynamic equilibrium with the environment, or what is the same, for not being in a dead state related to the *Reference Environment* (R.E.). Therefore, for calculating the exergy of any natural resource, a R.E. should be defined. This R.E. must be determined by the natural environment and can be assimilated to a thermodynamically dead planet where all materials have reacted, dispersed and mixed.



The determination of the natural capital exergy is necessarily linked to the definition and thermodynamic properties of the R.E. Hence the importance of an appropriate selection of a R.E. for evaluating natural resources. [Read more about Szarqut's R.E.](#)

Exergy Costs

Exergy accounts for a minimum. However, the real processes designed by man are far from the ideal conditions for reversibility and the energy requirements to obtain a resource are always greater than those dictated by the Second Law. For this reason, we cannot evaluate natural resources solely in terms of reversible processes since this would ignore technological limits, which are much more costly for man from the physical point of view. Therefore, we must include the real physical unit costs in the thermodynamic evaluation of resources.

The *exergy costs* are defined as the relationship between the energy invested in the real process of obtaining the resource and the minimum energy required if the process were reversible. They measure the number of exergy units needed to obtain one unit of exergy of the product.

[Read more...](#)



Thermoeological Costs



Industrial processes have an unfavourable influence upon the natural environment. These unfavourable effects can be divided into two groups: depletion of limited non-renewable resources and rejection of harmful substances. The depletion of non-renewable resources should be minimised to keep them for future humankind. Exergy can be applied as a measure of the quality of natural resources. The influence of human activities on the depletion of natural resources can be evaluated by means of the cumulative exergy calculus.

The *thermo-ecological cost* is defined as the cumulative consumption of non-renewable exergy connected with the fabrication of a particular product with inclusion of additional consumption resulting from the necessity of compensation of environmental losses caused by rejection of harmful substances to the environment. Moreover, the index of thermo-ecological cost should take into account the total life-time of the considered product or system.

[Read more...](#)

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Online chemical exergy calculator

- Based on the chemical exergies of the elements published by Szargut, Valero, Stanek and Valero D. 2005 in Trondheim.
- It calculates automatically the chemical exergy of more than 1000 inorganic substances. (It includes a Gibbs free energy database).
- If the substance is not included in the database, the program is still able to calculate its chemical energy. In this case, the user must introduce its own gibbs free energy.

<http://www.exergoecology.com>



Online chemical exergy calculator



Easy exergy calculator

This exergy calculator calculates automatically the chemical exergy of any chemical compound.

- See instructions for the exergy calculator [here](#).
- Go to the "[Advanced Exergy Calculator](#)" if you want to introduce your own Gibbs free energy value.

Results

Input Data

Chemical formula ■

Enter the chemical formula, eg. for "Annite" write: KFe3AlSi3O10(OH)2

Show all appearances

 calculate data

 clean

<http://www.exergoecology.com>



Online chemical exergy calculator



Easy exergy calculator

This exergy calculator calculates automatically the chemical exergy of any chemical compound.

- See instructions for the exergy calculator [here](#).
- Go to the "[Advanced Exergy Calculator](#)" if you want to introduce your own Gibbs free energy value.

Results

Exergy for formula **$\text{KFe}_3\text{AlSi}_3\text{O}_{10}(\text{OH})_2$** (**$\text{KFe}_3\text{AlSi}_3\text{O}_{10}(\text{OH})_2$ annite**) is **316.23** kJ/mol, calculated with Gibbs **-4799.72** kJ/mol from **Faure 1991**.

Input Data

Chemical formula ■

Enter the chemical formula, eg. for "Annite" write: $\text{KFe}_3\text{AlSi}_3\text{O}_{10}(\text{OH})_2$

Show all appearances

<http://www.exergoecology.com>



Online chemical exergy calculator



Advanced exergy calculator

See instructions for the exergy calculator [here](#).

Results

Exergy for formula **KFe3AlSi3O10(OH)2** is **316.23** kJ/mol.

[Back to easy Exergy Calculator](#)

Input Data

Chemical formula

Enter the chemical formula, eg. for "Annite" write: KFe3AlSi3O10(OH)2

Gibbs data

Enter the specific Gibbs free energy in kJ/mol, eg. -4852,4

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Bibliography



- All relevant references dealing with natural resources and exergy.
- Most references include an abstract.
- They can be downloaded as “.bib” file for LaTeX users. (The whole database or selected references).

<http://www.exergoecology.com>



Bibliography



Bibliography



Find relevant references on natural resources and exergy:




Bibliography

↓ download Bibtex file

Please, help us to complete our database. Send us valuable references not yet included!  Mail

For your information:  *Bibtex* is the standard *LaTeX* bibliography reference and publication management data format. If you wish, you can download free reference management tools for *bibtex* and *MS Word* under the following links:

-  [Jabref](#): import and export of bibtex files.
-  [Wibtex](#): import and export of bibtex files and direct export to Microsoft Word, RTM and HTM file format.

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Bibliography



This folder holds the following references to publications, sorted by year and author:

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Towards an international legal reference environment

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Abstract

The determination of the natural capital exergy is linked to the definition and thermodynamic properties of the Reference Environment (R.E.) used. Hence the importance of an appropriate selection of the R.E. The aim of this paper is to obtain, an agreement on the international reference environment for evaluating the natural resources on Earth. For this purpose, all the R.E. models published so far are systematically analyzed, the best suitable methodology for calculating the standard chemical exergy of the chemical elements is chosen and shown and the variables used in the chosen methodology are updated using new geochemical information and revisions done by other authors.

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Additional contents

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- News
- Relevant links
- Members workspace: discussion forum, chat rooms...

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Our hope...

- Our hope is that many more “exergoecology” practitioners join us, so that all relevant ideas and references appear in the portal.
- ...and of course that as many people as possible get to know the usefulness of that weird word!

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If you want to be a member...

Registration Form

Personal Details

Full Name

Enter full name, eg. John Smith.

User Name

Enter a user name, usually something like 'jsmith'. No spaces or special characters. Usernames and passwords are case sensitive, make sure the caps lock key is not enabled. This is the name used to log in.

E-mail

Enter an email address. This is necessary in case the password is lost. We respect your privacy, and will not give the address away to any third parties or expose it anywhere.

Password

Minimum 5 characters.

Confirm password

Re-enter the password. Make sure the passwords are identical.

Send a mail with the password

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