

**Visão global****1. Dados pessoais****Nome completo**

Hermanus Gerardus Maria Eggenkamp

**Nome sob o qual publica**

H.G.M. Eggenkamp

**Número de identificação fiscal (NIF)**

263311996

**Documento de identificação (BI, passaporte...)**

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**Data de nascimento**

22-10-1963

**País de nacionalidade**

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**Sexo**

M

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**2. Formação académica****Ano:** 1988**Grau:** MESTRADO**Classificação:** Met lof**Instituição que conferiu o grau:** Utrecht University**Faculdade:** n/a**Título da tese:** Hydrogeochemical study in the Chaves-Vial-Pouca area**Orientador:** Prof. Dr. C.H. van der Weijden**Co-orientador:****Domínio científico:** Geochemistry**Anos curriculares:** 4**Designação do curso:** Geology**Ano:** 1994**Grau:** DOUTORAMENTO**Classificação:** -**Instituição que conferiu o grau:** Utrecht University**Faculdade:** n/a**Título da tese:**  $\delta^{37}\text{Cl}$ ; The geochemistry of chlorine isotopes**Orientador:** Prof. Dr. R.D. Schuiling; Prof. Dr. A.F. Koster van Groos**Co-orientador:** Dr. R. Kreulen**Domínio científico:** Isotope geochemistry**Designação do curso:** -**3. Actividades anteriores e situação actual**

Período	Cargo, categoria ou actividade	Instituição
a	Investigador Auxiliar	Instituto Superior Técnico (PT)
a	Geochemist	Isolab BV (NL, Company, Geochemical and analytical services for the oil industry; www.isolab.com)
a	Assistant Professor	Utrecht University (NL)
a	Research Fellow (post-doctoral)	University of Reading (UK)
a	Research Assistent (Promovendus)	Utrecht University (NL)

**4. Área de actividade científica**

Stable isotope geochemistry, mainly focused on chlorine and bromine isotopes. Applied to many geological environments specific to evaporite and hydrological systems, but also on minerals and rocks. Studies on mineral water resources, oil formation waters, water and gas samples related to volcanism. Development of analytical techniques, most importantly to determine bromine isotopes in natural samples. Experimental and theoretical studies on fractionation of chlorine and in evaporite precipitation and diffusion in solution.

Much experience with gas and liquid chromatography, stand-alone and coupled with stable isotope ratio mass spectrometry (analyses of hydrocarbons). Experience with Rock-Eval, TOC and elemental analyses.

Experience with handling radio-isotopes, used to determine diffusion in soils and waste materials.

**5. Domínio de especialização****Domínio de especialização**

Stable isotope geochemistry, particularly of chlorine and bromine.  
 Hydrogeochemistry, water-rock interactions, evaporite deposits  
 Gas and liquid chromatography, stable isotope mass spectrometry (IRMS), including continuous flow (coupled gas chromatograph or elemental analyzer to isotope ratio mass spectrometer).

**Actuais interesses de investigação**

Geochemistry of water (Ground-, Formation-, Mineral water). Formation, development, and protection of water. Geochemical characterisation of processes taking place in these water bodies. Evaporite deposits, precipitation, (geo)chemistry, interaction with groundwater. Using isotope techniques to understand these processes. Much interest in the geochemistry (including geochemistry) of the halogens (especially Cl and Br).

**Outras competências/actividades**

Isotope geochemistry in general. Hydrocarbon geochemistry (related to oil, gas and coal deposits). Analytical techniques (instrumental/wet chemical).

**6. Experiência na orientação**

Assistant professor in the Faculty of Earth Sciences (Utrecht University, 1998 to 2000) to teach courses in isotope geochemistry and surface chemistry to second and third year students. Advisor to the stable isotope laboratory professor in the same department (2003 to 2005) to teach isotope geochemistry to third year students.  
 In 2011 local supervisor of the Iranian PhD student Rahim Bagheri Shesheh during his scientific visit to the Netherlands

**7. Participação em projectos****Participação em projectos de investigação (coordenador/membro de equipas)**

1988-1992: Geochemie van chloorisotopen (Geochemistry of chlorine isotopes). NL-NWO-AWON proj. 751.355.014. Member of team (Ph.D. student).  
 1995-1998: Fluid flow in basinal brines. UK-NERC proj. GR3/10360. Member of team (research fellow).  
 1999-2004: FLUMIRE - Modelos de migração- reacção de fluidos em sistemas hidrominerais, determinados através de composição isotópica ( $^{37}\text{Cl}/^{35}\text{Cl}$  e  $^{87}\text{Sr}/^{86}\text{Sr}$ ) de águas minerais e rochas encaixantes alteradas. PT-FCT proj. PRA/CTE/11004/98. Member of team.  
 2008- HIDROCALDAS "Contribuição da Hidrologia Isotópica para o Aperfeiçoamento do Modelo Conceptual de Circulação de Águas Termais das Caldas da Rainha" - PT-IST-UTL proj. N° 1577. Member of team.  
 2008- INOGAZ - Isótopos, Gases Nobres e Interação Água-Rocha nas Ilhas do Grupo Central do Arquipélago dos Açores. Contribuição para a avaliação do potencial geotérmico e do risco sísmico-vulcânico. PT-FCT proj. PTDC/CTE-GIN/68851/08. Member of team.

**8. Prémios e Distinções**

Ano	Prémio ou distinção	Entidade promotora
2010	Visiting Professorship	Institut de Physique du Globe de Paris

**9. Publications****Teses**

- H.G.M. Eggenkamp (1994)  $\delta^{37}\text{Cl}$ ; the geochemistry of chlorine isotopes. Geol. Ultrai. 116 150 pp. Utrecht University (PhD Thesis).
- H. Eggenkamp (1988) Verkennd onderzoek naar de chemische samenstelling van/en de chemische processen in de I van het Twenthe Kanaal ("Preliminary research to the chemical composition of/and the chemical processes in the soil of Twenthe Canal"). (supervised by Dr. G.J. de Lange, Faculty of Earth Sciences, Utrecht University, Utrecht, The Netherlands)
- H. Eggenkamp (1987) Bepaling van diffusie van (spore) elementen in reststoffen en bodems ("Determination of the diffusion (trace) elements in coal fly ash, phosphorus slag and soil"). (supervised by Prof. Dr. H.A. Das & Dr. H.A. van der Sloot, E Petten, The Netherlands).
- H. Eggenkamp, R. Wijland & P. Saager (1987) Hydrogeochemical studies in the Chaves - Vila Pouca Area. (supervised by Dr. C.H. van der Weijden, Faculty of Earth Sciences, Utrecht University, Utrecht, The Netherlands) (three theses written during the masters course)

**Capitulos de livros**

- H.G.M. Eggenkamp (2004) Summary of methods for determining the stable isotope composition of chlorine and bromine natural materials. in P.A. de Groot (Ed.) Handbook of Stable Isotope Analytical Techniques Volume I pp. 604-622. Elsevier
- M.L. Coleman, H.G.M. Eggenkamp & J.-F. Aranyosy (2001) Chlorine stable isotope characterisation of solute transport mudrocks. in Etude pour la faisabilité des stockages de déchets radioactifs. Actes des Journées Scientifiques ANDRA, 7, 8 et 9 décembre 1999. pp. 155-175.
- G.J. de Lange, B. van Os, P.A. Pruyssers, J.J. Middelburg, D. Castradori, P. van Santvoort, P.J. Müller, H. Eggenkamp & I. Prahl (1994) Possible early diagenetic alteration of palaeo proxies. in: Carbon cycling in the glacial ocean: Constraints on ocean's role in global change. Ed.: R. Zahn et al., NATO ASI Series I 17:225-258.

**Artigos em revistas de circulação internacional com arbitragem científica**

- J.M. Marques, P.M. Carreira, F. Goff, H.G.M. Eggenkamp, M. Antunes da Silva (2012) Input of  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios and Sr geochemical signatures to update knowledge on thermal and mineral waters flow paths in fractured rocks (N-Portugal). *J. Geochem.* 27: in press.
- H.E. Beekman, H.G.M. Eggenkamp & C.A.J. Appelo (2011) An integrated modelling approach to reconstruct complex solute transport mechanisms – Cl and  $\text{d}^{37}\text{Cl}$  in pore water of sediments from a former brackish lagoon in The Netherlands. *Appl. Geochem.* 26:257-268.
- J. M. Marques, P.M. Carreira, J. Espinha Marques, H.I. Chaminé, P.E. Fonseca, F.A. Monteiro Santos, H.G.M. Eggenkamp & Teixeira. (2010) The role of geosciences in the assessment of low-temperature geothermal resources (N-Portugal): a review. *Geosc. J.* 14: 423-442.
- J.M. Marques, H.G.M. Eggenkamp, H. Graça, P.M. Carreira, M.J. Matias, B. Mayer & D. Nunes (2010) Assessment of recharge and flowpaths in a limestone thermomineral aquifer system using environmental isotope tracers (Central Portugal). *Isot. Environ. Health Studies.* 46:156-165.
- H.G.M. Eggenkamp & M.L. Coleman (2009) The effect of aqueous diffusion on the fractionation of chlorine and bromine isotopes. *Geochim. Cosmochim. Acta* 73:3539-3548.
- M. Mushashi, T. Oi, H.G.M. Eggenkamp & M. Matsuo (2008) Chlorine isotope fractionation associated with volcanic activity at the Kusatsu-Bandaiko hot spring in Japan. *Isot. Environ. Health Studies.* 44:305-313.
- M. Musashi, T. Oi, H.G.M. Eggenkamp, Y. Yato & M. Matsuo (2007) An anion-exchange chromatographic study on chlorine isotope effect accompanying hydration. *J. Chrom. A* 1140:121-125.
- J.M. Marques, M. Andrade, P.M. Carreira, H.G.M. Eggenkamp, R.C. Graça, L. Aires-Barros & M. Antunes da Silva (2006) Chemical and isotopic signatures of  $\text{HCO}_3/\text{Na}/\text{CO}_2$ -rich geofluids, North Portugal. *Geofluids* 6:273-287.
- A. Godon, N. Jendrzewski, H.G.M. Eggenkamp, D.A. Banks, M. Ader, M.L. Coleman & F. Pineau (2004) A cross-calibrated chlorine isotopic measurements and suitability of seawater as the international reference material. *Chem. Geol.* 207:1-12
- M. Musashi, T. Oi, & H.G.M. Eggenkamp (2004) Experimental determination of chlorine isotope separation factor by anion exchange chromatography. *Anal. Chim. Acta* 508:37-40.
- N. Jendrzewski, H.G.M. Eggenkamp and M. L. Coleman (2001) Characterisation of chlorinated hydrocarbons from chl and carbon isotopic compositions: scope of application to environmental problems *Appl. Geochem.* 16:1021-1031.
- H.G.M. Eggenkamp & M.L. Coleman (2000) Rediscovery of classical methods and their application to the measurement of stable bromine isotopes in natural samples. *Chem. Geol.* 167:393-402.
- M.H.G. van Sambeek, H.G.M. Eggenkamp & M.J.M. Vissers (2000) The groundwater quality of Aruba, Bonaire and Curaçao: a hydrogeochemical study. *Geol. Mijnb./Neth. J. Geosc.* 79:459-466.
- L. Aires-Barros, J.M. Marques, R.C. Graça, M.J. Matias, C.H. van der Weijden, R. Kreulen & H.G.M. Eggenkamp (1998) and cold  $\text{CO}_2$ -rich mineral waters in Chaves geothermal area (Northern Portugal). *Geothermics* 27:89-107.
- H.G.M. Eggenkamp & A.F. Koster van Groos (1997) Chlorine stable isotopes in carbonatites: evidence for isotopic heterogeneity in the mantle. *Chem. Geol.* 140:137-143.
- N. Jendrzewski, H.G.M. Eggenkamp & M.L. Coleman (1997) Sequential determination of chlorine and carbon isotopic composition in single microlitre samples of chlorinated solvent. *Anal. Chem.* 69:4259-4266.
- H.G.M. Eggenkamp, R. Kreulen & A.F. Koster van Groos (1995) Chlorine stable isotope fractionation in evaporites. *Geochim. Cosmochim. Acta* 59:5169-5175.
- H.G.M. Eggenkamp & R.D. Schuiling (1995)  $\delta^{37}\text{Cl}$  variations in selected minerals; a possible tool for exploration. *J. Geophys. Res.* 100:249-255.
- H.G.M. Eggenkamp, J.J. Middelburg & R. Kreulen (1994) Preferential diffusion of  $^{35}\text{Cl}$  relative to  $^{37}\text{Cl}$  in sediments of Klamath, Indonesia. *Chem. Geol. (Isot. Geosc. Section)* 116:317-325.

**Artigos em revistas nacionais com arbitragem científica**

- H.G.M. Eggenkamp, J.M. Marques & H. Graça (2013) Application of stable chlorine isotopes to develop a conceptual model of the origin of the ground water circulating near the "salinas" at Rio Maior (Central Portugal). *Comunicações Geológicas* 199: in press.
- J.M. Marques, H. Graça, H.G.M. Eggenkamp, P.M. Carreira, B. Mayer & D. Nunes (2012) Contribuição de traçadores geoquímicos e isotópicos para a avaliação das águas termais das Caldas da Rainha. *Comunicações Geológicas* 99: in press.
- M. Musashi, H.G.M. Eggenkamp & Ph. van Cappellen (2010) Experiment on chlorine extraction from chlorinated pollutants in supercritical water and their Cl isotope analysis. *Bulletin of Science and Technology Shibaura Institute of Technology* 54: In Japanese with English abstract.
- M. Musashi, T. Oi, H.G.M. Eggenkamp, & Y. Yato (2004) Experimental determination of chlorine isotope effect by ion-exchange chromatography. *RADIOISOTOPES* 53:213-217. In Japanese with English abstract.

**Publicações em actas de encontros científicos**

Most relevant presentations.

- J.M. Marques, C. Matos, H.G.M. Eggenkamp, O. Neves, P.M. Carreira, D. Nunes, H. Graça & B. Mayer (2012) Use of oxygen-18 as a natural tracer to elucidate shallow / thermal groundwater interactions in a karst region (Central Portugal) XXXIX International Association of Hydrologists Congress. Niagara Falls, Ontario, Canada, 16-21 September.
- H.G.M. Eggenkamp, M. Bonifacie, M. Ader & P. Agrinier (2011) Fractionation of Cl and Br isotopes during precipitation on from their saturated solutions. 21th Annual V.M. Goldschmidt Conference. Prague, Czech Republic, 14-19 August. *Min. Mag.* 75 798.
- J.M. Marques, P.M. Carreira, H.G.M. Eggenkamp, M. Antunes da Silva & L. Aires-Barros (2011) Strontium isotopic ( $^{87}\text{Sr}$ ) and geochemical signatures of  $\text{CO}_2$ -rich thermal and mineral waters (N-Portugal). European Society for Isotope Research (ESIR), XI Isotope Workshop. Budapest, Hungary, 4-8 July. *Centr. Europ. Geol.* 54 141.
- H.G.M. Eggenkamp, J.M. Marques & H. Graça (2011) The use of  $\text{d}^{37}\text{Cl}$  to explain origin and production of salt from the spring "Fonte da Pina" in Rio Maior (Central Portugal). International Symposium on Isotopes in Hydrology, Marine Ecology

**10. Comunicações****Outras comunicações orais**

1st October 2008, Chlorine stable isotope signatures in hydrothermal systems: What do they tell us? (Centro de Geologia Faculdade de Ciências, Universidade de Lisboa, Lisbon, Portugal. Seminário: Geoquímica isotópica na caracterização, avaliação e monitorização de recursos hidrominerais. Abstract published in the proceedings (ISBN 978-989-20-1305-3), pp 30-33.)

3rd March 2000, Halogen isotopes as powerful tools in geologic problems. (Instituto Superior Técnico, Laboratório de Mineralogia e Petrologia, Lisbon, Portugal.)

6th January 2000, The use of stable halogen isotopes in geochemical and environmental applications. (KNCV Wintercor Ede, Netherlands.)

7th November 1997, Use of Cl (and Br) isotopes in hydrologic systems. (CNRS - Géosciences Rennes, Rennes, France)

26th September 1997, Just a little about chlorine and bromine isotopes. (School of Environmental Sciences, University of Anglia, Norwich, UK.)

10th June 1997, Quantifying diffusive processes in porewaters using stable isotopes of Cl (and Br): Examples from Indol Louisiana and the Netherlands. (National Wetlands Research Center, Lafayette, LA, USA, also on the 17th June 1997, Department of Environmental Sciences, University of Illinois at Chicago, Chicago, IL, USA.)

21st May 1996, Chlorine isotopes; A potentially powerful tool for geologic problems. (Institut de Physique du Globe de P Paris, France)

19th May 1995, Some aspects of chlorine isotope geochemistry. (Postgraduate Research Institute for Sedimentology, TR University of Reading, Reading, UK.)

**11. Línguas**

Língua	Leitura	Escrita	Conversação
Holandês	Excelente	Excelente	Excelente
Inglês	Excelente	Bom	Bom
Alemão	Bom	Elementar	Elementar
Francês	Elementar	Elementar	Elementar