

## CURRICULUM VITAE

DZENE Liva

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### ACADEMIC QUALIFICATIONS

- Doctorate Degree in Earth Sciences, University of Poitiers, France (*September 2016*)  
Thesis Title: “*Influence of particle size and crystal chemistry on cation exchange properties of swelling clay minerals*”
- MSc in Chemistry, University of Ottawa, Canada (*February 2014*)
- Master Degree in Earth Sciences, University of Poitiers, France (*September 2013*)
- BSc in Chemical Engineering, Riga Technical University, Latvia (*June 2011*)

### PROFESSIONAL EXPERIENCE

- 2017 – present     Assistant Professor  
**École Nationale Supérieure de Chimie de Mulhouse**  
**Institut de Science des Matériaux de Mulhouse (France)**  
Courses: Inorganic Chemistry, Instrumentation, Analytical Chemistry.  
Main research areas: clay mineral synthesis and characterization for application in catalysis.
- 2017                     Postdoctoral Researcher  
**Institut de Science des Matériaux de Mulhouse (France)**  
Main activities: Synthesis and characterization of iron-rich phyllosilicates in the context of long-live radioactive waste repository.
- 2013-2016             Doctorate Thesis  
**Institut de Chimie des Milieux et Matériaux de Poitiers (France)**  
Main activities: The research project investigated the role played by particle size and crystal-chemistry on the exchange and fixation of cesium and strontium on swelling clay minerals. It included experimental sorption isotherms and associated thermodynamic modelling on size-selected clay fractions and on synthetic samples. Complementary structural information was obtained by means of X-ray diffraction and molecular simulations. (Supervisors: Dr. Eric Ferrage, Prof. Emmanuel Tertre and Dr. Fabien Hubert)

- 2013            Master Thesis  
**Centre for Catalysis Research and Innovation (Canada)**  
Main activities: A biodegradable polymer-clay nanocomposite synthesis was performed optimizing various synthesis parameters followed by a characterization of the composite materials structure (XRD, TEM, NMR) and thermal properties (TGA). (Supervisors: Prof. Christian Detellier and Dr. Rola Mansa)
- 2012            Research Internship  
**GeoBioTec, University of Aveiro (Portugal)**  
Main activities: The project included a fieldtrip to Porto Santo Island, then further laboratory experiments of clay mineral extraction and their chemical (XRF), mineralogical (XRD) and mechanical (abrasion, plasticity) characterization. (Supervisors: Prof. Fernando Rocha and Dr. Ana QUINTELA)

### **AWARDS AND HONORS**

- Best presentation: 3rd place for oral presentation at the Clay Minerals Society's Annual Meeting in Atlanta, USA (2016)
- Student Travel Grant: Clay Mineral Society's Student Travel Grant to attend Euroclay conference / 52nd CMS Annual Meeting at Edinburgh, Scotland (2015)
- European Commission Scholarship of Erasmus Mundus for International Master of Advanced Clay Science (2011 - 2013)
- Kristaps Morbergs scholarship (2009 - 2010)

### **RESEARCH INTERESTS**

1. **Synthesis of lamellar silicates for application in catalysis and composite materials:** hydrothermal synthesis, hybrid organic-inorganic layered compound synthesis and polymer-clay composite synthesis.
2. **Characterization of layered minerals:** structure analysis by X-ray diffraction coupled with adsorption experiments to investigate the reactivity of different surfaces.

### **PROFESSIONAL ACTIVITIES**

Reviewer for international journals: Environmental Science & Technology, Chemistry Letters, Minerals, Applied Geochemistry, Comptes Rendus de Chimie, Chemosphere

#### Organization of conferences

- Scientific committee and chairman of session "Modification and synthesis of clays" of 9<sup>th</sup> Mid-European Clay Conference, 17-21 September 2018, Zagreb, Croatia.
- Chairman of 2nd International and Interdisciplinary Symposium „Clays and Ceramics”, 29-31 January 2018, Riga, Latvia.
- Scientific committee of 1st International and Interdisciplinary Symposium „Clays and Ceramics”, 28-29 January 2016, Riga, Latvia.

- Organization committee of the seminar “Clays and their characterization”, 1-2 February 2016, Riga, Latvia.

#### Scientific Societies

- French Delegate in European Young Chemist Network 2020-2022.
- Member of the Board of Directors of French Clay Group since 2019.
- Board member of Latvian Clay Scientific Society since 2015.
- Member of Clay Mineral Society since 2013.
- Chair of regional section Alsace of Réseau-Jeunes de Société Chimique de France 2018-2020.

### **STUDENT SUPERVISION**

#### PhD

1. Laura CIPRIANO-CRAPINA (2019 - ongoing) – Subject: Synthesis of catalysts based on iron-rich hybrid talc-like lamellar materials for application in advanced oxidation processes

#### Master Internships

4. Sebastian MEYER (2019, 6 months) – Subject: Characterization of synthetic clay minerals for the study of their acid properties
3. Hugo CASSES (2019, 6 months) – Subject: Characterization of cement-based material in the context of long-live radioactive waste repository
2. Axel CAPITAINE (2018, 4 months) – Subject: Synthesis of saponites for the study of their acid properties
1. Héloïse VERRON (2015, 4 months) – Subject: Influence of the layer charge on the cesium desorption from saponites

### **SCIENTIFIC PRODUCTION**

- **Articles in Peer-reviewed journals**

8. **Dzene, L.**; Brendlé, J., Limousy, L., Dutournié, P., Martin, C., Michau, N. (2018) Synthesis of iron-rich tri-octahedral clay minerals: A review. *Applied Clay Science*, **166**, 276-287.
7. **Dzene, L.**; Verron, H.; Delville A.; Michot L. J.; Robert J.-L.; Tertre E.; Hubert, F.; Ferrage, E. (2017) Influence of tetrahedral layer charge on the fixation of cesium in synthetic smectite. *Journal of Physical Chemistry C*, **121** (42), 23422-23435.
6. Jurgelane I., Sevjakova V., **Dzene L.** (2017) Influence on illitic clay addition on the stability of sunflower oil in water emulsion. *Colloids and Surfaces A: Physicochemical and Engineering Aspects*, **529**, 178-184.

5. **Dzene, L.**; Ferrage, E.; Viennet J.-C., Tertre, E.; Hubert, F. (2017) Crystal structure control of aluminized clay minerals on the mobility of caesium in contaminated soil environments. *Scientific Reports*, **7**; 43187.
4. **Dzene, L.**; Ferrage, E.; Hubert, F.; Delville A.; Tertre, E. (2016) Experimental evidence of the contrasting reactivity of external vs. interlayer adsorption sites on swelling clay minerals: the case of  $\text{Sr}^{2+}$ -for- $\text{Ca}^{2+}$  exchange in vermiculite. *Applied Clay Science*, **132-133**, 205-215.
3. Viennet J.-C.; Hubert F.; Tertre E.; Robin V.; **Dzene L.**; Ferrage F.; Turpault M.-P. (2016) Effect of particle size on the dissolution and aluminization processes of K vermiculite. *Geochimica et Cosmochimica Acta*, **180**, 164-176.
2. Mansa R.; **Dzene L.**; Rocha F.; Quintela A.; Detellier C. (2016) Preparation and Characterization of Novel Clay/Scleroglucan Nanocomposites. *Applied Clay Science*, **126**, 235-244.
1. **Dzene, L.**; Tertre, E.; Hubert, F.; Ferrage, E. (2015) Nature of the sites involved in the process of cesium desorption from vermiculite. *Journal of Colloid and Interface Science*, **455**, 254–260.

- **Other articles**

**Dzene L.**; Jeguirim M.; Brendle J.; Limousy L. (2019) Foreword of Second international symposium Clays and ceramics for environmental applications. *Comptes Rendus Chimie*, **22**, 103-104.

Barbane I.; Sedmale G.; **Dzene L.** (2011) Research of Dolomite – Clay Mixtures for Development of Roman Cement. *Scientific Journal of Riga Technical University*. Series 1. “Materials Science and Applied Chemistry”, **24**, 35-38.

- **Conference Communications**

Oral communications (international):

10. Boumaiza H., **Dzene L.**, Brendlé, J., Limousy, L., Dutournié, P., Martin, C., Michau, N. Synthesis of iron rich clays in the Fe/Si system using statistical experimental design. Euroclay 2019, Paris, France (1-5 July 2019).
9. **Dzene L.**, Brendlé, J.; Limousy, L.; Dutournié, P.; Martin, C.; Michau, N. Formation of iron-rich phyllosilicates in Si-Fe system in function of Fe/Si molar ratio. 9<sup>th</sup> Mid-European Clay Conference, Zagreb, Croatia (17-21 September 2018).
8. **Dzene L.**, Verron H., Delville A., Michot L. J., Robert J.-L., Tertre E., Hubert, F., Ferrage, E. Synthetic clays for study of complex soil phenomena: case of caesium desorption process. 2<sup>nd</sup> International, Interdisciplinary Symposium “Clays and Ceramics”, Riga, Latvia (29-31 January 2018).
7. **Dzene L.**, Verron H., Tertre E., Hubert F., Robert J.-L., Delville A., Michot L., **Ferrage E.** Influence of layer charge on cesium desorption process from 2:1 swelling clay minerals. 54<sup>rd</sup> Clay Mineral Society Meeting, Edmonton, Canada (2-8 June 2017).

6. **Dzene L.**, Ferrage E., Hubert F., Delville A., Tertre E. Experimental evidence of contrasted reactivity of external vs. interlayer adsorption sites on swelling clay minerals: the case of Sr<sup>2+</sup>-for-Ca<sup>2+</sup> exchange in vermiculite. 53<sup>rd</sup> Clay Mineral Society Meeting, Atlanta, USA (5-8 June 2016).
5. Mansa R., Dziadkowiec J., **Dzene L.**, Quintela A., Rocha F., **Detellier C.** Clay minerals bionanocomposites: preparation, characterization and tests for drug release applications. 53<sup>rd</sup> Clay Mineral Society Meeting, Atlanta, USA (5-8 June 2016).
4. **Hubert F.**, Viennet J.-C., **Dzene L.**, Tertre E., Lanson B., Ferrage E. Hydroxy-interlayered minerals: crystal structure, formation and implication for soil reactivity. 16<sup>th</sup> International Clay Conference, Granada, Spain (17-21 July 2017).
3. **Dzene L.**, Ferrage E., Viennet J.-C., Verron H., Robert J.-L., Delville A., Michot L., Tertre E., Hubert F. Caesium retention in swelling clay minerals: influence of layer charge and hydroxy-interlayering. 16<sup>th</sup> International Clay Conference, Granada, Spain (17-21 July 2017).
2. **Dzene L.**, Tertre E., Hubert F., Ferrage E. Nature of sites involved in cesium desorption from vermiculite. Euroclay Conference, Edinburgh, Scotland (5-10 July 2015).
1. **Dzene L.**, Tertre E., Hubert F., Ferrage E. Cs<sup>+</sup>-for-Na<sup>+</sup> exchange on vermiculite – influence of particle size. Mid-European Clay Conference, Dresden, Germany (16-19 September 2014).

Oral communications (national):

5. Meyer S., Bennici S., Vaultot C., **Dzene L.** Influence du traitement de précurseur et de la température de synthèse sur la structure de saponite. 16<sup>ème</sup> Colloque du Groupe Français des Argiles, Nantes, France (18-20 May 2020).
4. **Dzene L.**, Tertre E., Hubert F., Ferrage E. Influence of particle size on ion-exchange properties of swelling clay minerals. 14<sup>ème</sup> Colloque du Groupe Français des Argiles, Poitiers, France (18-20 May 2016).
3. **Dzene L.**, Tertre E., Hubert F., Ferrage E. Sr<sup>2+</sup>-for-Ca<sup>2+</sup> exchange on different particle size fractions of vermiculite. 74<sup>th</sup> scientific conference of the University of Latvia, Riga, Latvia (28-29 January 2016).
2. **Dzene L.**, Verron H., Tertre E., Hubert F., Robert J.-L., Ferrage E. Influence of particle size and layer charge on cesium desorption process from 2:1 swelling clay minerals. 3<sup>rd</sup> Russian Clay Group Meeting “ГЛИНЫ-2015”, Moscow, Russia (2-4 December 2015).
1. **Dzene L.**, Tertre E., Hubert F., Ferrage E. Nature des sites impliqués dans le processus de désorption du césium de particules de vermiculite. 13<sup>ème</sup> Colloque du Groupe Français des Argiles, Clermont-Ferrand, France (19-21 May 2015).

Posters:

5. **Dzene L.**, Dutournié P., Boumaiza H., Brendlé J., Limousy L., Martin C., Michau N. Precipitation of iron-rich silicates in FeO-SiO<sub>2</sub> system. 8th International Conference on Clays in Natural and Engineered Barriers for Radioactive Waste Confinement, Nancy, France (8-11 June 2020).
4. **Dzene L.**, Brendlé, J., Limousy, L., Dutournié, P., Martin, C., Michau, N. Synthesis of two type Fe-Si clay mineral-like materials. Matériaux 2018, Strasbourg, France (19-23 November 2018).
3. **Dzene L.**, Ferrage E., Viennet J.-C., Verron H., Robert J.-L., Delville A., Michot L., Hubert F., Tertre E. Caesium retention in swelling clay minerals: influence of particle size, layer charge and hydroxy-interlayering. 15<sup>ème</sup> Colloque du Groupe Français des Argiles, Marseille, France (22-24 May 2017).
2. **Verron H.**, **Dzene L.**, Tertre E., Hubert F., Robert J.-L., Ferrage E. Influence de la charge structurale des saponites sur la désorption du césium. 14<sup>ème</sup> Colloque du Groupe Français des Argiles, Poitiers, France (18-20 May 2016).
1. **Mansa R.**, Huang C.T., **Dzene L.**, Detellier C. Novel Clay Nanocomposites: Preparation and Characterization using Various Biopolymers and Fillers. Canadian Chemistry Conference, Ottawa, Canada (13-17 June 2015).