AARHUS UNIVERSITY
DEPARTMENT OF GEOSCIENCE

Large equipment and facilities

Instrument	***Model***	**Usage**	***Year***	***Responsible staff***	**Location**
C-N-S Analyzer	*Elementar Vario Max CNS*	*Measurements of carbon (TC and TIC/TOC), TN (Dumas combustion method) and TS. Combustion <1150º Celsius. Autosampler available.*	*2012*	*Rikke Brok Jensen*	*1674-234*
Scanning electron microscope (SEM)	*Tescan Vega*	*-*	*2022*	*Trine Ravn-Jonsen, Rasmus Andreasen*	*1674-141*
X-ray diffraction (XRD) *Cu-tube*	*Panalytical X'Pert Pro PW3050/60*	*Identification of crystalline materials or clay minerals by means of powder x-ray diffraction. Clay minerals (<0.002mm) are concentrated by sedimentation. 3 steps clay: Untreated, treated with ethylene glycol as well as after heating (to 500º Celsius).*	*2006*	*Trine Ravn-Jonsen, Rasmus Andreasen*	*1674-141*
Sedimentation cylinders and pipettes	*"Andreasen"*	*Sedimentation analysis (Stoke's Law) by using the "Andreasen pipette" on material <0.063 mm. Used for particle sizing of very fine material or as the preparatory step for XRD analysis of clay minerals.*	*-*	*Charlotte Rasmussen*	*1672-040*
X-ray fluorescence (XRF) core scanner *Cr- or Mo-tube*	*Itrax, COX Analytical Systems*	*Qualitative detection of elements from Al to U in sediment cores. Also provided is RGB image, x-ray photograph and magnetic susceptibility.*	*2012*	*Trine Ravn-Jonsen*	*1672-030*
Micro-XRF (table top) *Rh-tube*	*Bruker - Tornado M4*	*In-situ determination of major and trace elements in rocks, metals, artifacts and powder. Spatial resolution 20um.*	*2016*	*Rasmus Andreasen*	*1672-338*
Portable-XRF (handheld) *Rh-tube*	*Bruker - S1 Titan 800*	*Determination of major and trace elements on geological or archeological samples. Good to screen heavier elements when doing field work.*	*2016*	*Rasmus Andreasen*	*1672-030*

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For further info contact head of laboratories, Charlotte Rasmussen

Titrator	*Titralab, Radiometer autoburette ABU900, TIM900 titration manager*	*Measurement of alkalinity and chloride.*	*1996*	*Trine Ravn-Jonsen*	*1674-138*
Laserdiffraction	*Sympatec HELOS*	*Determination of particle size distribution by light scattering. VIBRI/GRADIS module for dry material and QUIXEL module for wet. Available lenses: R1 (0.18-35.0 µm), R4 (1.8-350.0 µm) and R7 (18.0-3500 µm). Quartz flow cells, sizes 2 or 6 mm (QUIXEL module). 31 classes.*	*1997*	*Charlotte Rasmussen, Trine Ravn-Jonsen*	*1674-132*
Sieving machines	*Pascall inclyno*	*Used for separation purposes and to determine particle size for various experiments. Used with 20 cm or 8-inch sieves (Endecott), mesh sizes normally 0.032-16mm. Brass or steel.*	*-*	*Trine Ravn-Jonsen*	*1672-020*
Particle Shape analyzer	*Sympatec QICPIC*	*Particle size distribution in the range 0.02-20mm (M8 lens) and particle shape in the range 0.06-20mm by using dynamic image analysis. Examples of parameters available for evaluation: Feret diameter, sphericity, aspect ratio, convexity, fibre length and more. Unlimited number of calculated classes.*	*2013*	*Trine Ravn-Jonsen*	*1672-039*
Differential Thermal Analysis (DTA)	*Netzsch*	*DTA and TG (thermogravimetry) for experiments on e.g., clay or powder. Temperature <1150° Celsius.*	*2014*	*Rikke Brok Jensen*	*1674-234*
Cosmo-lab, Semi-clean	*-*	*Dating of sediments using cosmogenic isotopes (Be-10 and Al-26). Preparatory processes include sieving, magnetic separation, floatation, treatment with "Aqua Regia", boiling with phosphoric acid, HF/HNO_3 leaching, oxidation, ion exchange, target preparation.*	*2015*	*Birte Eriksen, Rikke Brok Jensen*	*1674-238*
Multi-collector inductively coupled plasma mass spectrometer (MC-ICPMS)	*Nu Plasma II*	*High precision isotope analysis, including Fe, Si, Rb/Sr, Sm/Nd, Lu/Hf.*	*2015*	*Rasmus Andreasen*	*Isotope lab*

Quadrupole inductively coupled plasma mass spectrometer (Q-ICPMS)	*Agilent 7900*	*Trace and ultra-trace element analysis from solution or laser ablation.*	*2015*	*Rasmus Andreasen*	*Isotope lab*
Laser ablation	*Resonetics M 155, 193nm ArF Excimer laser*	*Ablation of samples, and sample introduction to both Q-ICPMS and MC-ICPMS.*	*2015*	*Rasmus Andreasen*	*Isotope lab*
High pressure liquid chromatography (HPLC)	*Agilent 1260 Infinity*	*Speciation measurements (e.g. As, I).*	*2015*	*Rasmus Andreasen*	*Isotope lab*
Gas chromatography and mass spectrometer (GC-MS) with pyrolysis unit	*Agilent*	*LOC lab*	*2019*	*Arka Rudra, Rasmus Andreasen*	*1674-138*
Gas chromatography and mass spectrometer (GC-MS)	*Agilent 5977C*	*Biomarker lab*	*2023*	*Rachel Lupien, Christof Pearce, Trine Ravn-Jonsen*	*1674-138*
Accelerated Solvent Extractor (ASE)	*Thermo Scientific Dionex ASE 350*	*Biomarker lab*	*2023*	*Rachel Lupien, Trine Ravn-Jonsen*	*1674-138*
Pyrolyses and oxidation	*Hawk by Wildcat Technologies*	*Determination of S1 (free oil), S2 (kerogen yield), S3 and S4. Available options are T_{max}, kinetic calculations, TOC, "carbonate carbon" (CC) and other parameters. He is carrier gas for pyrolysis, hydrogen is used as FID fuel and hydrocarbon free air as FID fuel and oxidation carrier. Sample size normally 0.050 g of <0.250mm (mesh size 60) of ground material. Maximum temperature is 850^{o} Celsius. Autosampler fits 126 steel crucibles.*	*2018*	*Arka Rudra, Rasmus Andreasen*	*1674-138*
High pressure Asher (HPA-S)	*Anton Paar*	*High-performance acid digestion, mainly for PGE analysis. Fits 5 samples simultaneously.*	*2019*	*Rasmus Andreasen*	*1672-042*
Ring shear	WILLE GEOTECHNIK	*Mechanical experiments with continuous deformation of unconsolidated (soft) sediments.*	*2001*	*Jan Piotrowski*	*1672-039*

Preparatory equipment	-	*Crushing, grinding, sawing, Wilfley table etc.*	-	*Various*	*1672-046, 1672-047, 1672-042*
Epoxy lab	-	*Facility to make casts, polish etc.*	-	*Rikke Brok Jensen*	*1674-236*
Biomarker	-	*Investigation of organic biomarkers in marine and lake sediments as proxies for past climate and ocean conditions. Procedures include preparation of sediment samples for GC-MS analyses by solvent extraction and separation into fractions of different polarities and other parameters. Compounds of interest include IP25, leaf waxes, PAHs, fecal sterols, and more.*	*2023*	*Rachel Lupien, Christof Pearce, Trine Ravn-Jonsen*	*1674-138*
Micro-tephra	-	*Detection of volcanic ash in low concentrations (crypto-tephra) in marine and terrestrial sediment deposits for dating purposes.* *Techniques involve sieving, heavy liquid density separation, optical microscopy etc.*	*2019*	*Christof Pearce, Trine Ravn-Jonsen*	*1672-242*
Micro-thermometry	*Linkam*	*Attached to a Nikon microscope we have computer-controlled equipment to determine homogenization temperatures and salinity of melt- and fluid inclusions. 2 stages are available: 1) THMSG600 (temperature range from -190^{o} to +600^{o} Celsius) and 2) TS1400XY (temperature up to +1400^{o} Celsius).*	*2011*	-	*1672-338*