**Table 1: Operating conditions for the LA-ICP-MS equipment**

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| **Laboratory & Sample Preparation** |  |
| Laboratory name | Géosciences Rennes, UMR CNRS 6118, Rennes, France |
| Sample type/mineral | zircon  |
| Sample preparation | Conventional mineral separation, 1 inch resin mount, 1 μm polish to finish |
| Imaging | (CL) imaging using a Quanta 200 SEM with centaurus detector at the Laboratoire “Magmas d’océanologie et de géosciences”, Université de Lille-1 (Lille, France). |
| **Laser ablation system** |  |
| Make, Model & type | ESI NWR193UC, Excimer |
| Ablation cell | ESI NWR TwoVol2 |
| Laser wavelength  | 193 nm |
| Pulse width  | < 5 ns |
| Fluence  | 7 J/cm–2 |
| Repetition rate  | 5 Hz |
| Spot size  | 25 μm  |
| Sampling mode / pattern | Single spot |
| Carrier gas | 100% He, Ar make-up gas and N2 (3 ml/min) combined using an in-house smoothing device |
| Background collection  | 20 seconds |
| Ablation duration | 60 seconds |
| Wash-out delay | 15 seconds |
| Cell carrier gas flow (He) | 0.75 l/min  |
| **ICP-MS Instrument** |  |
| Make, Model & type | Agilent 7700×, Q-ICP-MS |
| Sample introduction | Via conventional tubing  |
| RF power  | 1350W |
| Sampler, skimmer cones | Ni |
| Extraction lenses | X type |
| Make-up gas flow (Ar) | 0.85 l/min |
| Detection system | Single collector secondary electron multiplier |
| Data acquisition protocol | Time-resolved analysis |
| Scanning mode | Peak hopping, one point per peak |
| Detector mode | Pulse counting, dead time correction applied, and analogue mode when signal intensity > ~ 106 cps |
| Masses measured |  204(Hg + Pb), 206Pb, 207Pb, 208Pb, 232Th, 238U |
| Integration time per peak  | 10-30 ms  |
| Sensitivity / Efficiency  | 20000 cps/ppm Pb (50µm, 10Hz) |
| **Data Processing** |  |
| Gas blank | 20 seconds on-peak  |
| Calibration strategy | GJ1 zircon standard used as primary reference material, Plešovice used as secondary reference material (quality control) |
| Reference material info | GJ1 (Jackson et al., 2004)Plešovice (Slama et al., 2008) |
| Data processing package used  | GLITTER ® (van Achterbergh et al., 2001) |
| Quality control / Validation | Plešovice: concordia age = 336.8 ± 0.67 Ma (*N* = 32; MSWD=0.084)  |