**Table 8-1. Geochronologic constraints on Najd faulting.**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Age** | **Unit dated** | **Method** | **Fault zone affected** | **Comment** | **Source** |
| 731±8 | An Nakhil gneiss:granite | U-Pb, SHRIMP | An Nakhil shear zone, part of Ar Rika-Qazaz system | Pre-dates Najd deformation | Kennedy and others, 2004 |
| 705±4 | Zaam group paragneiss | U-Pb, SHRIMP | Qazaz-Ajjaj | Predates deformation on Ajjaj shear zone | Kennedy and others, in press |
| 670±10 | Hamadat diorite gneiss | U-Pb, SHRIMP | Qazaz-Ajjaj | Pre-dates Najd deformation | Kennedy and others, 2004 |
| 567±86 | Abu Aris granite |  |  | Cut by Najd faults; constrains brittle deformation | Fleck and Hadley, 1982 |
| 630±19 | Raydan pluton | Rb-Sr | Qazaz | Cataclastically deformed by Najd faulting: open isotopic system, constrains active faulting | Kemp and others, 1980 |
| 632±15 | Haml suite: Awjah complex | U-Pb |  | Pluton cut by Najd fault; constrains maximum age of faulting | Stacey and Ager, 1985 |
| 637±2 | Pegmatite in Kirsh granite gneiss | U-Pb, SHRIMP | Ar Rika | 637 possibly main crystallization event: subsequent recrystallization (metamorphic?) events between 623 and 589 Ma; constrain ductile deformation | Kennedy and others, 2005 |
| 632±3 | Hufayrah complex: alkali-feldspar granite | U-Pb |  | Pluton cut by Najd fault; constrains maximum age of faulting | Stacey and Ager, 1985 |
| 588±12 | Jabal Tukhfah granite | Rb-Sr | Halaban-Zarghat | May post-date Najd faulting; constrains cessation of movement | Fleck and Hadley, 1982 |
| 626±4 | Abu Suar complex | U-Pb, SHRIMP | Qazaz-Ajjaj | Granite predates deformation on Qazaz shear zone | Kennedy and others, in press |
| 624.9±4.2 | Murdama rhyolite: basement of Jifn basin | U-Pb | Halaban-Zarghat | Maximum age of formation of basin and initiation of dextral movement on Halaban-Zarghat fault | Kusky and Matsah, 2003 |
| 621±7 | Biotite-hornblende quartz diorite | U-Pb | Halaban-Zarghat | Pluton is cut by the Halaban-Zarghat fault; similar rocks exposed 10 km to the west on south side of fault: indicates right-offset after emplacement, and implies a <621 Ma period of dextral shearing | Cole and Hedge, 1986 |
| 620±7 | Al Asfah pluton: hornblende-biotite quartz monzodiorite (Idah suite) | U-Pb | Halaban-Zarghat | Truncates NW-trending splay faults that connect with Halaban-Zarghat fault: indicates offset on the splays had ended by about 620 Ma. Inferred that major transcurrent movement predates Idah suite, i.e. >620 Ma | Cole and Hedge, 1986 |
| 609±4 | Ash Sha’b complex | U-Pb SHRIMP | Qazaz-Ajjaj | Massive granite with gneissic “tail” caught up along Qazaz shear zone: ductile deformation post-dates 609 Ma | Kennedy and others, in press |
| 609±3 | Hadb complex | U-Pb, SHRIMP | Qazaz-Ajjaj |  | Kennedy and others, in press |
| 601±4 | Dahul granite | U-Pb | Between Ar Rika and Ruwah faults | Cut by brittle fault; constrains minimum brittle deformation | Aleinikoff and Stoeser, 1988 |
| 599±5 | Dhaiqa formation | U-Pb, SHRIMP | Qazaz-Ajjaj | Possible age of igneous zircon, implying deposition </= 599 Ma. Constrains brittle Najd deformation | Kennedy and others, in press |
| 574±28 | Ar Rahadah pluton: alkalki-feldpsar granite | Rb-Sr | Halaban-Zarghat | Intrudes Murdama group and cut by Najd fault | Calvez and others, 1984 |
| ~600 | Kirsh granite gneiss | U-Pb, SHRIMP | Ar Rika | A possible metamorphic age; possible constraint on ductile deformation | Kennedy and others, 2005 |
| 579±19 | Kursh granite | Rb-Sr | Between Ar Rika and Ruwah faults | Constrains brittle deformation | Calvez and others, 1983 |
| 577±21 | Sanam pluton | Rb-Sr |  | Crystallization age is 607±18: this is open isotopic system; constrains active faulting | Calvez and others, 1983 |
| 591±6 | Undeformed “Najd granite” | U-Pb zircon Concordia method | Ruwah fault zone | Intruded gneisses along the Najd fault; constrains minimum age of faulting | J.S. Stacey, written communication, 1983; cited by Kellogg and others, 1986. |
| 575±10 | Foliated granite on margin of Ajjaj shear zone | U-Pb, SHRIMP | Qazaz-Ajjaj | Predates or synchronous with ductile deformation on Ajjaj shear zone | Kennedy and others, in press |
| 576.6±5.3 | Undeformed felsite dike | U-Pb | Halaban-Zarghat | Intrudes Jibalah group in Jifn basin; gives a minimum age for movement on Halaban-Zarghat fault | Kusky and Matsah, 2003 |
| 573±8 | Habariyah monzogranite gneiss | U-Pb, SHRIMP | Halaban-Zarghat | Inferred main crystallization event: evidence of hydrothermal alteration between 531-512 Ma. Constrains ductile deformation as <573 Ma | Kennedy and others, 2005 |
| 573±6 | Undeformed lamprophyre dikes cross cutting Ajjaj shear zone gneiss | U-Pb, SHRIMP | Qazaz-Ajjaj | Constrains cessation of ductile deformation on Ajjaj shear zone | Kennedy and others, in press |
| 560±4 | Jibalah group, Dhaiqa formation | U-Pb TIMS | Qazaz-Ajjaj | Age of igneous zircon; maximum deposition age; Constrains brittle Najd deformation | Vickers-Rich and others, in press |
| ~620-~580 | Kirsh granite gneiss | U-Pb, SHRIMP | Ar Rika | Possible crystallization age range | Kennedy and others, 2005 |
| 566±8 | Jibalah group (Antaq basin) | LA-ICP-MS | Halaban-Zarghat | Maximum deposition age; faulting active | Nettle, 2009 |
| 568±11 | Jibalah group (Antaq basin) | LA-ICP-MS | Halaban-Zarghat | Maximum deposition age; faulting active | Nettle, 2009 |
| 584±10 | Jibalah group (Antaq basin) | LA-ICP-MS | Halaban-Zarghat | Maximum deposition age; faulting active | Nettle, 2009 |