Production of $^{100}$Mo for Cyclotron Conversion to $^{99m}$Tc

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Klydon (Pty) Ltd. – Pretoria - South Africa
• Klydon is a private company registered in South Africa

• Scientists who were previously part of the uranium enrichment operations at Atomic Energy Corporation / UCOR (now NECSA)

• Partnered with the IDC (Industrial Development Corporation of South Africa)
• Aerodynamic Separation Process (ASP) in development since 2002

• ASP is an innovative separation technology:
  • proven isotope separation technology;
  • low energy consumption and low capital requirements;
  • Substantial improvement over the genesis technology employed at other facilities.

• ASP is a versatile technology with application in several fields:
  • Uranium enrichment for fuel in nuclear energy;
  • Nuclear-related isotopes: Boron, Zinc, Zirconium, Deuterium, etc.
  • Silicon enrichment, for improved thermal management of microprocessor chips and for improved solar cell efficiency;
  • O-18 & Mo-100 for healthcare; and
  • Gas Separation - Methane harvesting from natural gas wells, biogas, shale gas, etc.
Stationary wall centrifuge:

- No moving parts as in a conventional centrifuge
- Pressurised flow through cylindrical wall for centrifugal isotopic separation
- No special materials required
- Cost-efficient at small scale
- Small production modules ➔ flexible capacity deployment
- Can be scaled up from lower initial capacity
- High separation efficiency ➔ low energy cost
- Demonstrated cost efficiency for silicon, carbon, oxygen, zirconium, and molybdenum, and the separation of gases
• ASP has cleaned-up natural gas
• Commercial viability is achieved at small plant level.
• The ASP process is easily scaled to industrial level.
• An ASP plant can be constructed in any country that adheres to the IAEA protocols for the protection of dual use technology.
SF$_6$ at 23.5 °C & 200 °C

- **Gamma**: 23.5°C - 1.087, 200°C - 1.083
- **Beta**: 23.5°C - 1.877, 200°C - 1.842
- **Alpha**: 23.5°C - 2.039, 200°C - 1.994
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