

Table C.1: Hydrogen Fuel Quality Specification

Constituent	Chemical Formula	Limits	Laboratory Test Methods to Consider and Under Development	Minimum Analytical Detection Limit
Hydrogen fuel index	H ₂	>99.97%		
Total allowable non-hydrogen, non-helium, non-particulate constituent		100 µmol/mol		
Acceptable limit of each individual constituent				
Water	H ₂ O	5 µmol/mol	ASTM D7653-10, ASTM D7649-10	0.12 µmol/mol
Total hydrocarbons (C ₁ basis)		2 µmol/mol	ASTM D7675-11	0.1 µmol/mol
Oxygen	O ₂	5 µmol/mol	ASTM D7649-10	1 µmol/mol
Helium	He	300 µmol/mol	ASTM D1945-03	100 µmol/mol
Nitrogen, Argon	N ₂ , Ar	100 µmol/mol	ASTM D7649-10	5 µmol/mol
Carbon dioxide	CO ₂	2 µmol/mol	ASTM D7649-10, ASTM D7653-10	0.1 µmol/mol
Carbon monoxide	CO	0.2 µmol/mol	ASTM D7653-10	0.01 µmol/mol
Total sulfur		0.004 µmol/mol	ASTM D7652-11	0.00002 µmol/mol
Formaldehyde	HCHO	0.01 µmol/mol	ASTM D7653-10	0.01 µmol/mol
Formic acid	HCOOH	0.2 µmol/mol	ASTM D7550-09, ASTM D7653-10	0.02 µmol/mol
Ammonia	NH ₃	0.1 µmol/mol	ASTM D7653-10	0.02 µmol/mol
Total halogenates		0.05 µmol/mol	ASTM WK23815, WK34574	0.01 µmol/mol
Particulate Concentration		1 mg/kg	ASTM D7650-10, ASTM D7651-10	0.005 mg/kg