

Supplementary

The Formation of Small Amounts of Cyclopropane during Pulsed Pyrolysis of C4–C5 Acyclic Alkanes in the Adiabatic Compression Reactor

Igor V. Bilera

List of figures

S1 – Representative chromatograms of *n*-butane pyrolysis products and the initial mixture from the CP-Al₂O₃/KCl PLOT column at standard analysis conditions.

S2 – Representative chromatograms of isobutane pyrolysis products and the initial mixture from the CP-Al₂O₃/KCl PLOT column at standard analysis conditions.

S3 – Representative chromatograms of *n*-butane pyrolysis products and the initial mixture from the CP-Al₂O₃/KCl PLOT column at standard analysis conditions: zoom view.

S4 – Representative chromatograms of isobutane pyrolysis products and the initial mixture from the CP-Al₂O₃/KCl PLOT column at standard analysis conditions: zoom view.

S5 – Representative chromatograms of *n*-pentane pyrolysis products and the initial mixture from the CP-Al₂O₃/KCl PLOT column at standard analysis conditions: zoom view.

S6 – Representative chromatograms of isopentane pyrolysis products and the initial mixture from the CP-Al₂O₃/KCl PLOT column at standard analysis conditions: zoom view.

S7 – Representative chromatograms of isobutane pyrolysis products and the initial mixture from the CP-PoraBOND Q column at standard analysis conditions: zoom view.

S8 – Representative chromatograms of isobutane pyrolysis products and the initial mixture from the CP-PoraPLOT U column: zoom view.

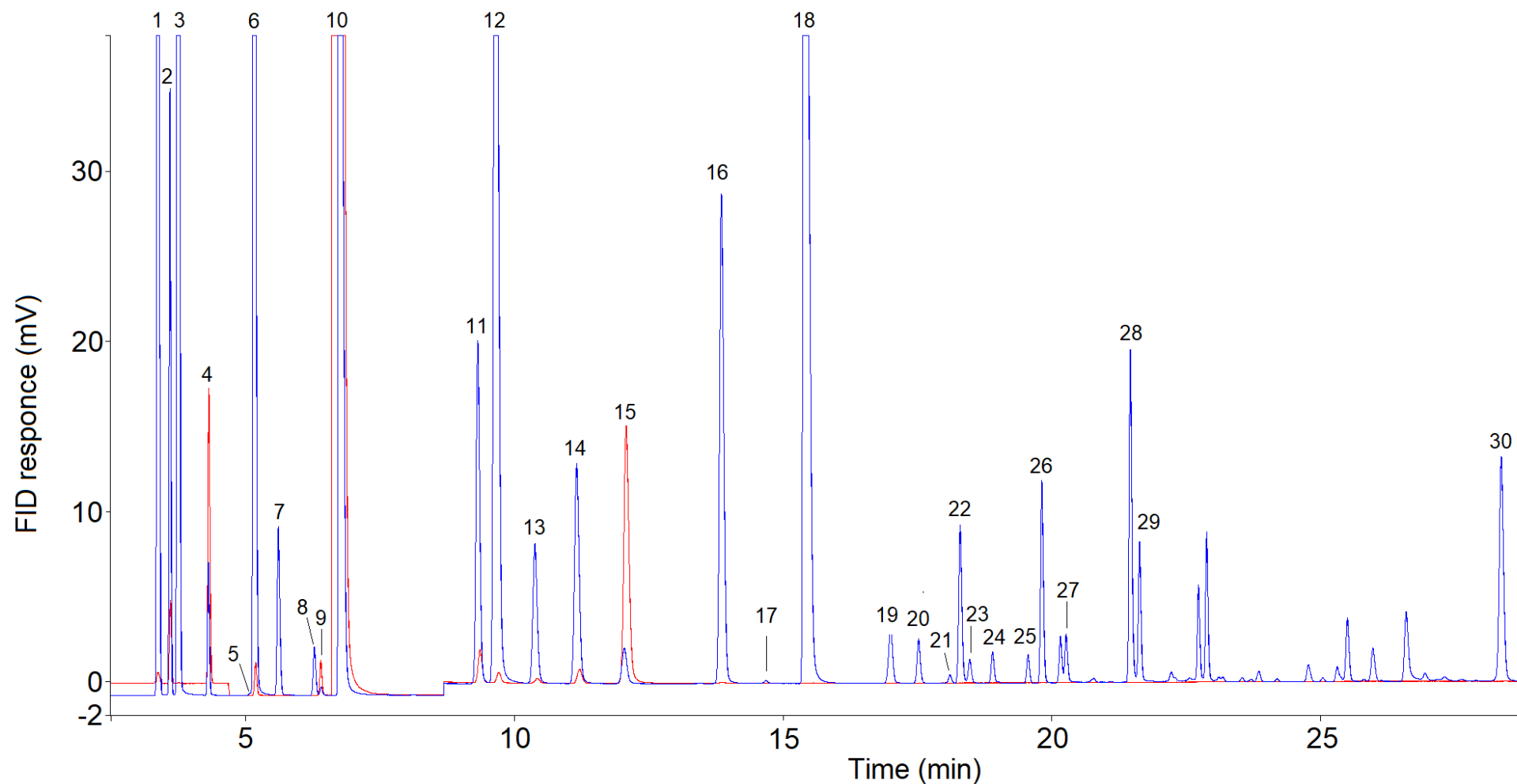


Figure S1. Representative chromatograms of *n*-butane pyrolysis products (blue) and the initial mixture (red) from the CP-Al₂O₃/KCl PLOT column at standard analysis conditions. FID attenuation 1 : 10 from 2.0' to 8.7'. Note that the larger peaks are well off-scale to allow observation of the minor products. Identified compounds: 1 = methane; 2 = ethane; 3 = ethylene; 4 = propane; 5 = cyclopropane; 6 = propylene; 7 = acetylene; 8 = allene; 9 = isobutane; 10 = *n*-butane; 11 = *trans*-butene; 12 = but-1-ene; 13 = isobutene; 14 = *cis*-butene; 15 = *neo*-pentane; 16 = methylacetylene; 17 = *n*-pentane; 18 = 1,3-butadiene; 19 = 3-methylbut-1-ene; 20 = *trans*-pentene; 21 = 2-methylbut-2-ene; 22 = pent-1-ene; 23 = 2-methylbut-1-ene; 24 = *cis*-pentene; 25 = but-2-yne; 26 = vinylacetylene; 27 = but-1-yne; 28 = cyclopentadiene; 29 = isoprene; 30 = benzene.

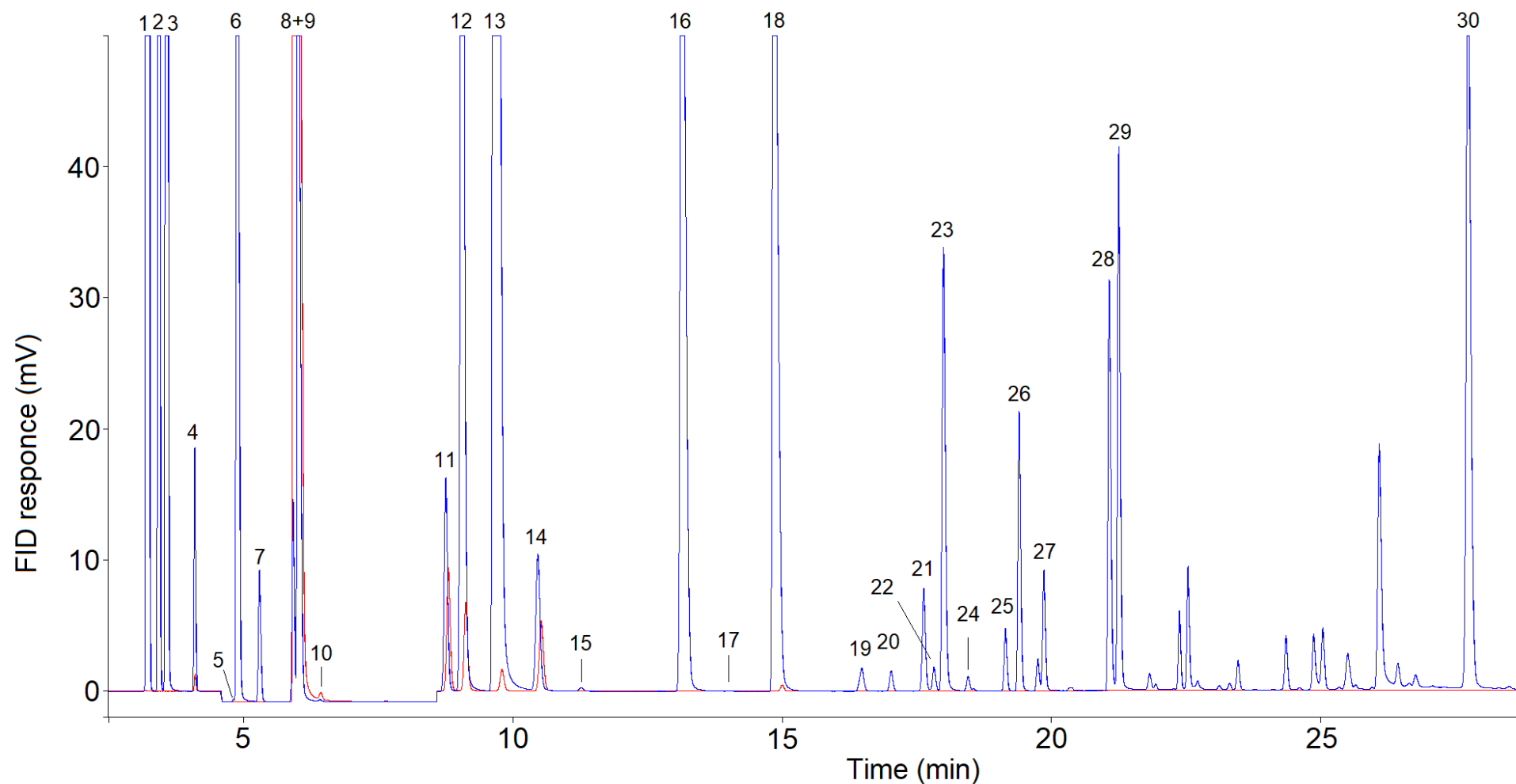


Figure S2. Representative chromatograms of isobutane pyrolysis products (blue) and the initial mixture (red) from the CP-Al₂O₃/KCl PLOT column at standard analysis conditions. FID attenuation 1 : 10 from 4.6' to 8.6'. Note that the larger peaks are well off-scale to allow observation of the minor products. Identified compounds: 1 = methane; 2 = ethane; 3 = ethylene; 4 = propane; 5 = cyclopropane; 6 = propylene; 7 = acetylene; 8 = allene; 9 = isobutane; 10 = *n*-butane; 11 = *trans*-butene; 12 = but-1-ene; 13 = isobutene; 14 = *cis*-butene; 15 = *neo*-pentane; 16 = methylacetylene; 17 = *n*-pentane; 18 = 1,3-butadiene; 19 = 3-methylbut-1-ene; 20 = *trans*-pentene; 21 = 2-methylbut-2-ene; 22 = pent-1-ene; 23 = 2-methylbut-1-ene; 24 = *cis*-pentene; 25 = but-2-yne; 26 = vinylacetylene; 27 = but-1-yne; 28 = cyclopentadiene; 29 = isoprene; 30 = benzene.

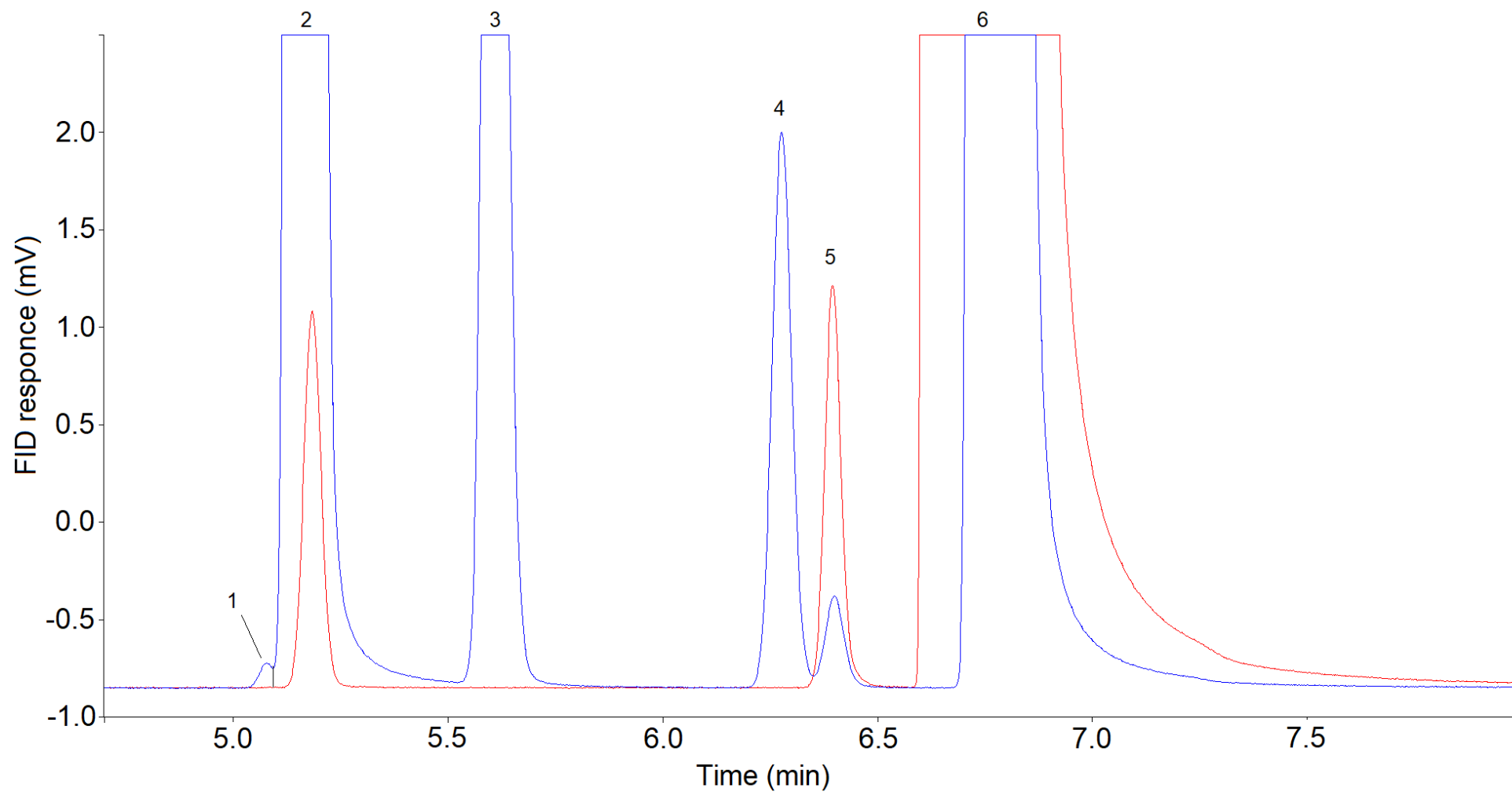


Figure S3. Representative chromatograms of *n*-butane pyrolysis products (blue) and the initial mixture (red) from the CP-Al₂O₃/KCl PLOT column at standard analysis conditions: zoom view. FID attenuation 1 : 10 from 2.0' to 8.7'. Note that the larger peaks are well off-scale to allow observation of the minor products. Identified compounds: 1 = cyclopropane; 2 = propylene; 3 = acetylene; 4 = allene; 5 = isobutane; 6 = *n*-butane.

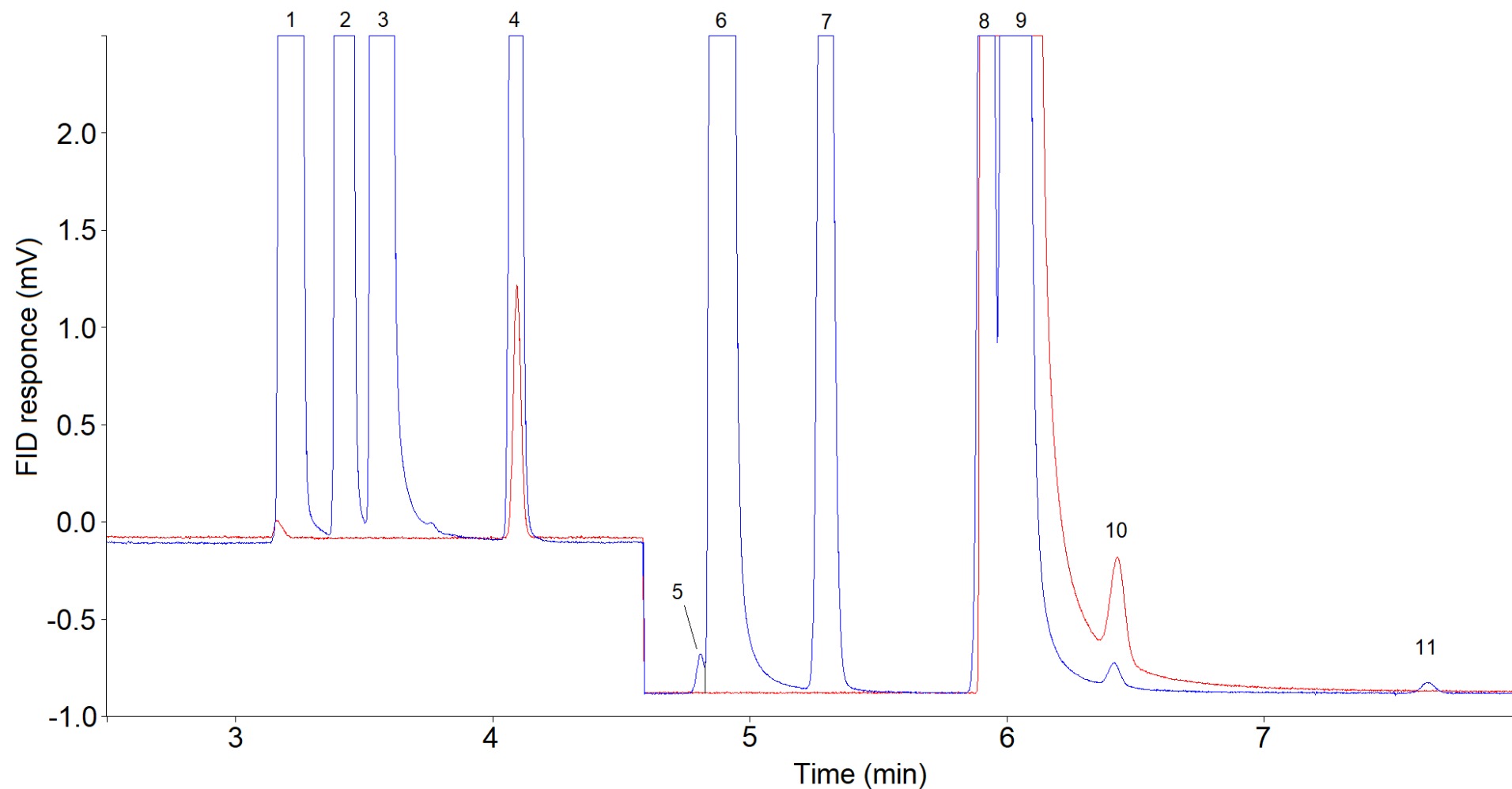


Figure S4. Representative chromatograms of isobutane pyrolysis products (blue) and the initial mixture (red) from the CP-Al₂O₃/KCl PLOT column at standard analysis conditions: zoom view. FID attenuation 1 : 10 from 4.6' to 8.6'. Note that the larger peaks are well off-scale to allow observation of the minor products. Identified compounds: 1 = methane; 2 = ethane; 3 = ethylene; 4 = propane; 5 = cyclopropane; 6 = propylene; 7 = acetylene; 8 = allene; 9 = isobutane; 10 = *n*-butane; 11 = unknown substance.

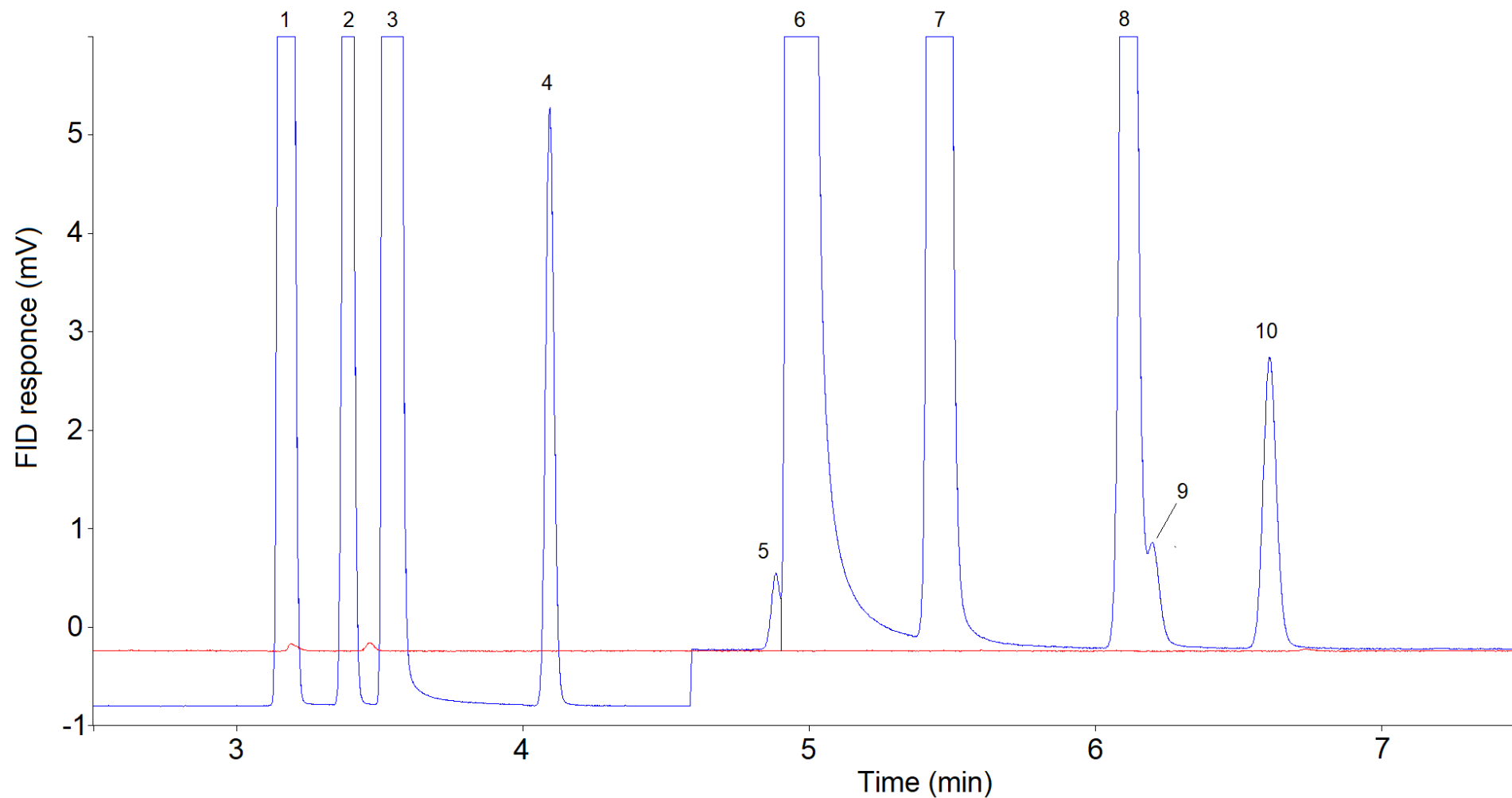


Figure S5. Representative chromatograms of *n*-pentane pyrolysis products (blue) and the initial mixture (red) from the CP-Al₂O₃/KCl PLOT column at standard analysis conditions: zoom view. FID attenuation 1 : 10 from 2.0' to 4.6'. Note that the larger peaks are well off-scale to allow observation of the minor products. Identified compounds: 1 = methane; 2 = ethane; 3 = ethylene; 4 = propane; 5 = cyclopropane; 6 = propylene; 7 = acetylene; 8 = allene; 9 = isobutane; 10 = *n*-butane.

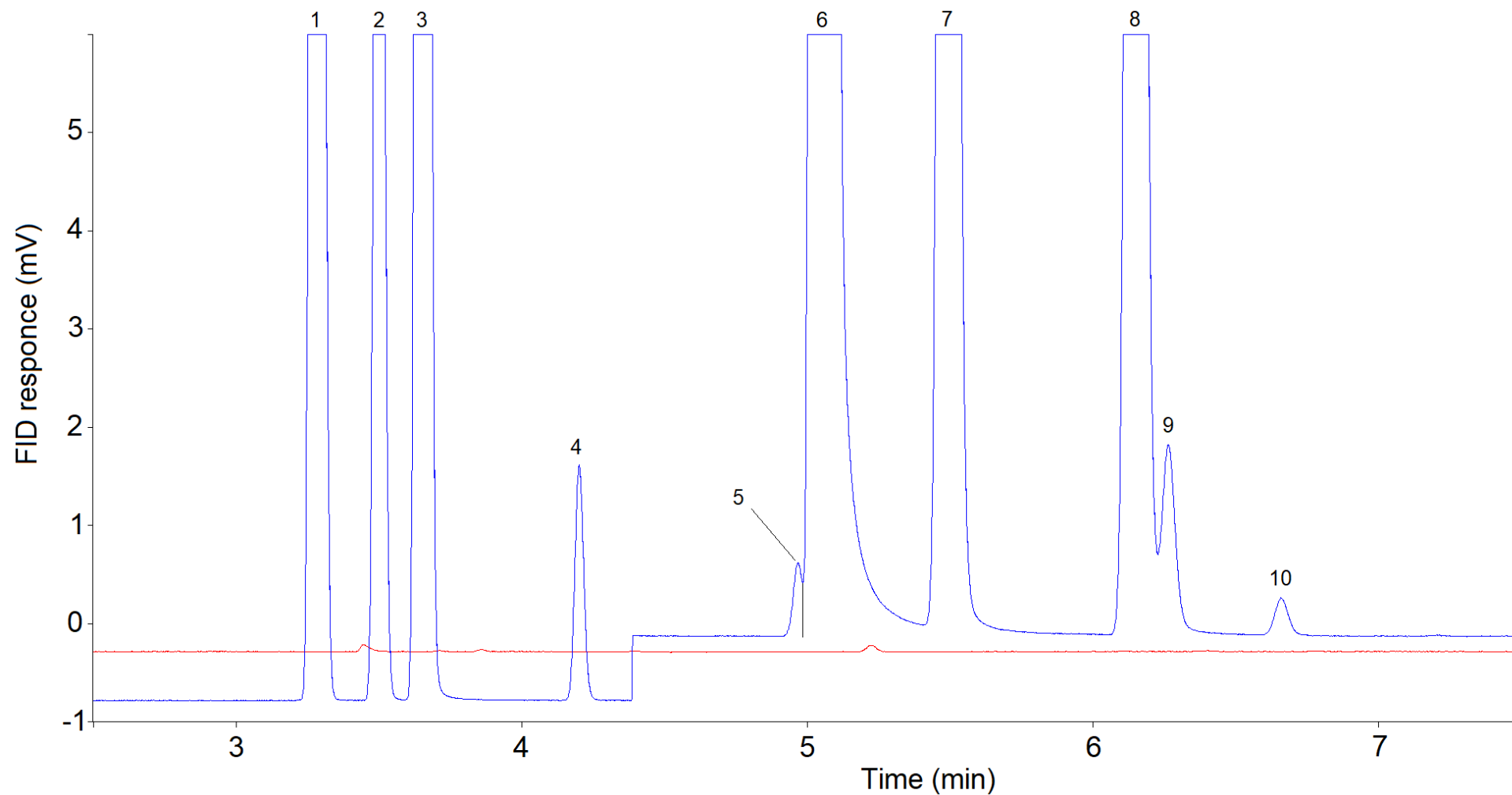


Figure S6. Representative chromatograms of isopentane pyrolysis products (blue) and the initial mixture (red) from the CP-Al₂O₃/KCl PLOT column at standard analysis conditions: zoom view. FID attenuation 1 : 10 from 2.0' to 4.4'. Note that the larger peaks are well off-scale to allow observation of the minor products. Identified compounds: 1 = methane; 2 = ethane; 3 = ethylene; 4 = propane; 5 = cyclopropane; 6 = propylene; 7 = acetylene; 8 = allene; 9 = isobutane; 10 = *n*-butane.

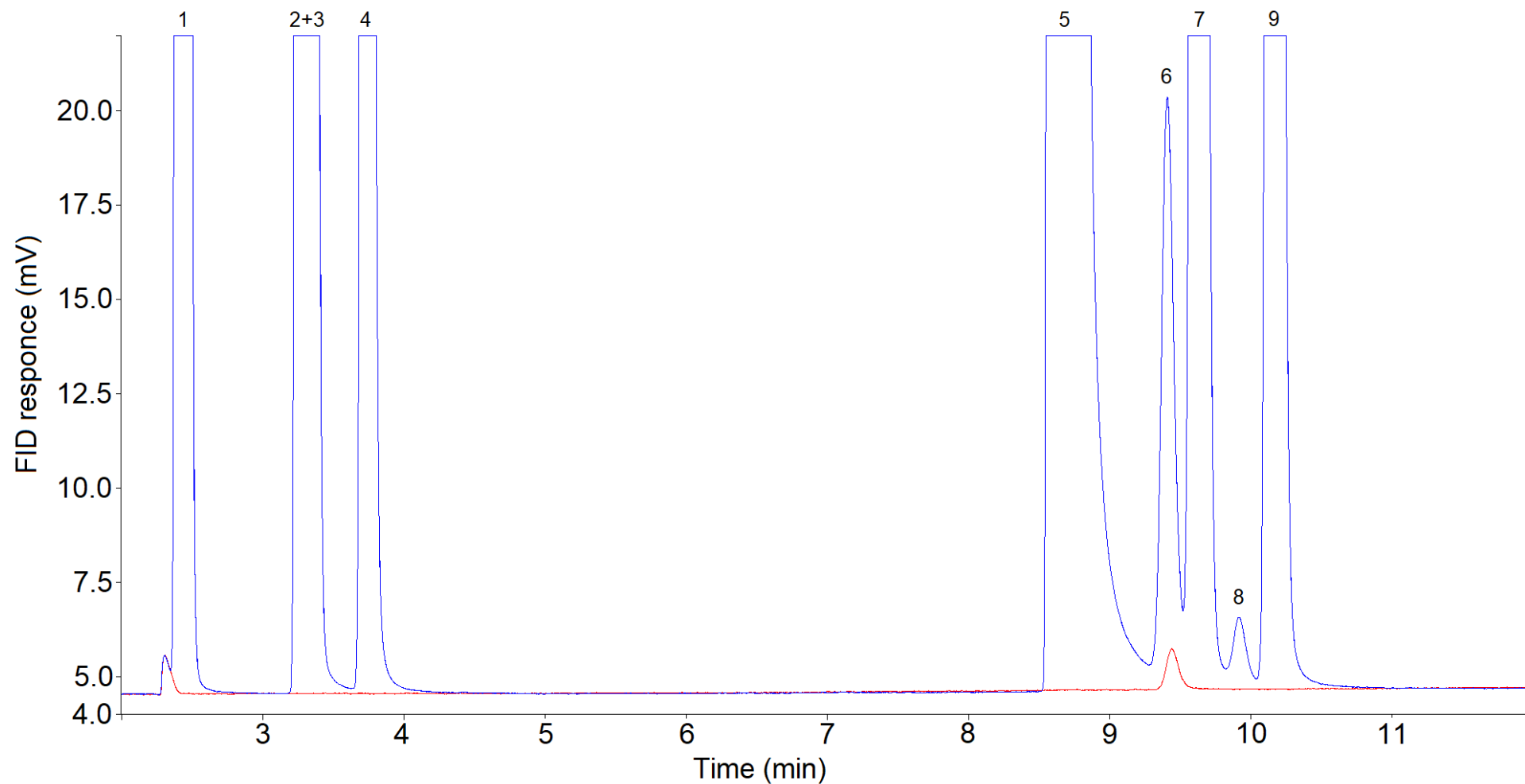


Figure S7. Representative chromatograms of isobutane pyrolysis products (blue) and the initial mixture (red) from the CP-PoraBOND Q column at standard analysis conditions: zoom view. Note that the larger peaks are well off-scale to allow observation of the minor products. Identified compounds: 1 = methane; 2+3 = ethylene + acetylene; 4 = ethane; 5 = propylene; 6 = propane; 7 = allene; 8 = cyclopropane; 9 = methylacetylene.

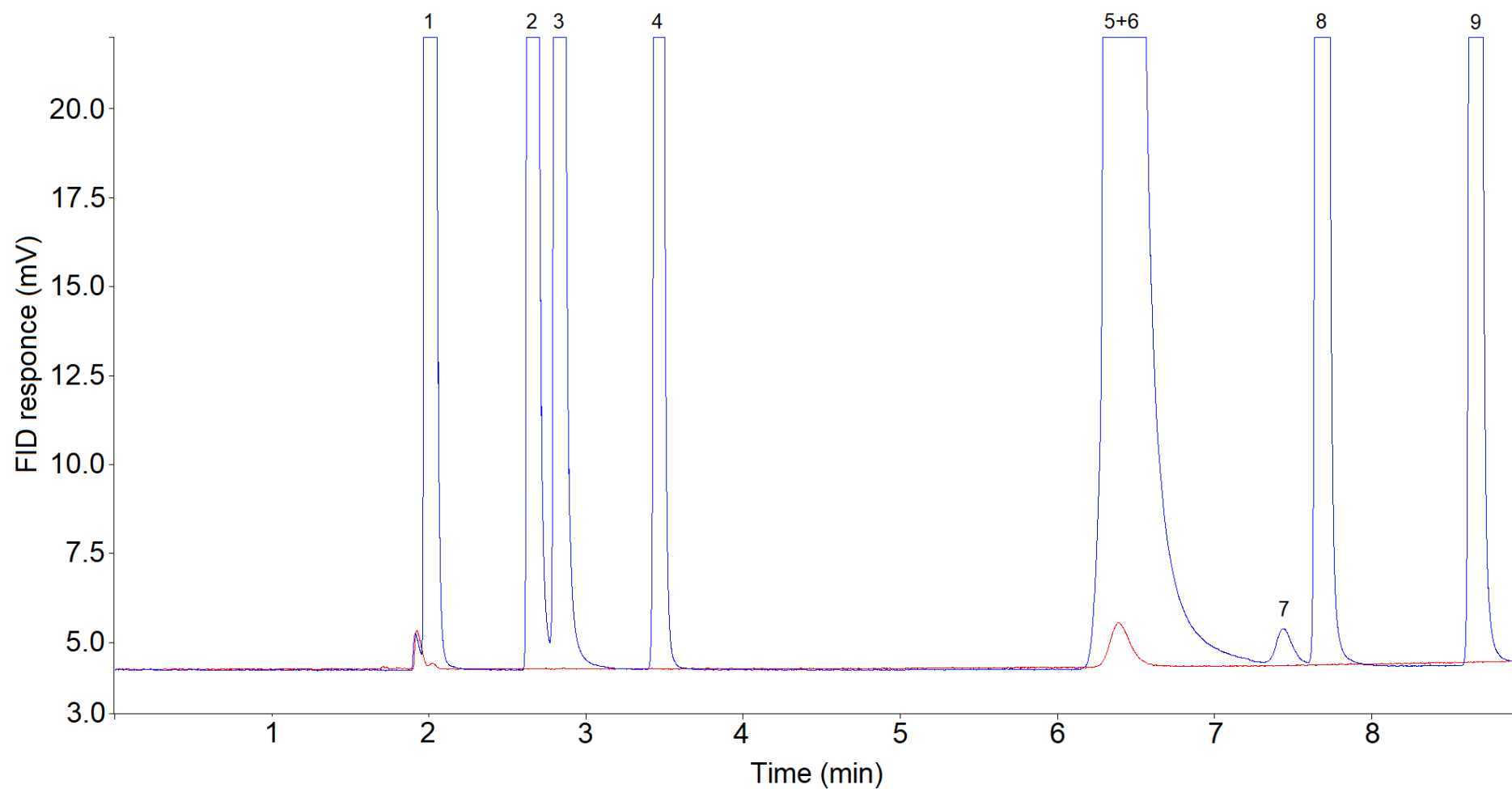


Figure S8. Representative chromatograms of isobutane pyrolysis products (blue) and the initial mixture (red) from the CP-PoraPLOT U column: zoom view. Note that the larger peaks are well off-scale to allow observation of the minor products. Identified compounds: 1 = methane; 2 = ethylene; 3 = ethane; 4 = acetylene; 5 + 6 = propane + propylene; 7 = cyclopropane; 8 = allene; 9 = methylacetylene.