

APPENDIX TABLE 5-31 
S&E articles in chemistry, by region, country, or economy: 2003–16

(Number)

Region, country, or economy	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
World	99,215.0	111,918.0	124,730.0	130,271.0	130,284.0	137,982.0	140,801.0	148,546.0	164,151.0	165,646.0	175,254.0	182,922.0	189,417.0	180,557.0
North America	19,524.6	23,034.8	25,953.1	24,952.9	24,508.7	26,971.2	24,599.4	26,646.3	29,228.2	27,260.7	27,859.1	27,439.3	26,743.3	24,768.3
Canada	2,160.5	2,399.0	2,648.2	2,812.1	2,724.7	2,883.6	2,937.0	3,020.1	3,310.8	3,220.8	3,315.6	3,111.8	3,123.9	2,862.9
Greenland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
Mexico	451.8	517.9	627.0	548.3	701.2	739.2	778.4	835.6	911.9	896.2	935.6	946.8	997.3	925.3
United States	16,912.3	20,118.0	22,677.9	21,592.5	21,082.9	23,348.4	20,884.0	22,790.6	25,005.5	23,143.6	23,607.9	23,380.7	22,622.0	20,980.1
Central America and Caribbean	107.9	116.1	117.5	115.3	135.4	139.9	141.9	138.1	174.6	169.9	124.3	164.0	125.9	109.3
Antigua and Barbuda	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.3	0.0	0.0	0.0	0.0
Bahamas, The	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Barbados	4.3	3.0	2.8	3.0	3.2	5.0	0.0	0.9	1.3	2.7	1.2	2.6	3.5	3.3
Belize	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Costa Rica	2.1	4.4	3.3	2.0	5.5	10.9	6.0	4.2	9.2	6.4	7.8	12.4	6.4	4.0
Cuba	49.0	53.3	55.8	53.6	54.0	52.3	50.2	45.7	91.7	67.3	51.2	69.6	50.1	55.8
Dominica	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0
Dominican Republic	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1	0.3	0.4	0.3	0.4	0.1
El Salvador	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.0	0.1	0.1	0.0	0.0	0.2	0.3



Region, country, or economy	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Grenada	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.4
Guatemala	0.0	0.0	0.0	0.0	1.0	0.0	0.0	0.3	0.3	1.6	0.0	0.0	0.1	0.3
Haiti	0.0	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Honduras	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.4	0.0	0.0	0.0	0.0	0.0
Jamaica	11.6	9.0	12.4	7.7	9.9	9.5	12.5	10.6	9.2	10.2	12.9	7.9	2.7	4.9
Nicaragua	0.0	0.0	0.2	0.0	0.0	0.3	0.0	0.0	0.3	0.2	0.0	0.0	0.0	0.0
Panama	0.2	2.3	0.6	1.1	1.0	2.7	1.6	0.3	0.8	4.2	0.4	1.3	3.7	3.1
Puerto Rico	37.6	40.7	37.7	46.3	56.7	53.7	66.3	69.5	51.9	69.2	46.2	61.1	52.0	34.7
Saint Kitts and Nevis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Saint Lucia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Saint Vincent and the Grenadines	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Trinidad and Tobago	3.1	3.2	4.8	1.7	3.2	4.2	5.0	6.7	8.9	7.5	4.3	8.2	6.8	2.5
South America	2,370.8	2,570.7	2,875.5	3,075.9	3,167.9	3,618.1	3,628.3	3,696.5	4,045.7	4,056.9	4,309.7	4,589.5	4,484.8	4,494.4
Argentina	490.2	419.9	489.3	441.3	452.4	570.0	546.7	565.1	621.1	580.4	607.4	586.5	608.7	616.8
Bolivia	0.8	0.6	0.3	0.2	1.0	2.5	1.5	0.8	2.4	0.4	3.9	0.6	1.7	1.9
Brazil	1,390.2	1,676.8	1,856.0	2,154.4	2,168.6	2,396.7	2,431.5	2,458.2	2,693.5	2,814.4	2,976.5	3,290.9	3,135.8	3,118.1
Chile	249.7	203.0	226.9	223.4	219.2	237.9	268.8	261.3	307.1	307.4	327.0	307.8	317.8	352.0
Colombia	41.1	56.5	62.5	67.0	83.8	162.1	166.3	213.3	226.6	180.4	235.2	249.1	264.7	237.0
Ecuador	4.2	1.4	3.7	2.6	3.8	2.4	2.3	3.3	1.7	0.5	5.0	10.9	17.6	33.0



Region, country, or economy	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Guyana	2.0	3.0	12.4	0.5	2.0	4.1	2.0	3.0	1.0	1.0	1.0	1.0	0.0	0.3
Paraguay	0.0	0.0	0.0	0.1	0.0	1.0	0.5	2.5	0.2	1.6	0.0	0.7	1.6	0.4
Peru	6.5	1.5	11.8	3.6	2.0	4.8	4.6	3.9	5.6	5.8	7.5	11.1	11.0	14.6
Suriname	0.2	0.0	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.2	0.0	0.3	0.0
Uruguay	18.6	23.4	22.9	23.0	31.8	35.6	31.8	32.5	51.5	34.5	40.5	42.4	36.3	44.6
Venezuela	167.3	184.7	189.3	159.8	203.1	200.9	172.4	152.5	135.0	130.2	105.6	88.5	89.3	75.6
Europe	41,155.3	43,824.1	44,888.3	44,987.3	45,800.3	47,165.4	48,008.6	49,978.9	52,882.1	51,567.8	54,208.2	53,983.3	55,411.5	52,655.8
EU	31,341.6	33,812.7	34,978.1	35,791.8	36,316.2	37,194.6	37,870.7	39,507.2	41,945.7	41,294.7	43,150.9	42,672.9	43,630.6	40,859.9
Austria	491.9	580.4	545.8	537.7	553.5	640.6	663.9	673.3	699.0	686.1	744.4	775.5	786.4	747.1
Belgium	808.5	910.7	951.2	916.4	959.1	920.7	998.0	1,039.2	1,097.7	1,083.0	1,141.3	1,122.9	1,131.1	1,006.6
Bulgaria	246.7	276.3	271.2	310.1	307.7	324.8	279.1	304.5	364.7	363.5	369.5	317.3	294.9	214.5
Croatia	198.6	232.7	283.7	226.1	292.0	278.7	287.5	274.3	303.8	294.3	260.3	241.0	268.9	270.9
Cyprus	7.5	18.0	17.8	25.3	29.5	22.5	43.3	34.1	43.3	40.0	56.3	45.4	48.3	38.7
Czech Republic	693.0	751.7	963.8	903.4	963.3	1,166.6	1,076.7	1,140.1	1,447.7	1,230.9	1,336.4	1,324.5	1,409.7	1,283.1
Denmark	396.7	419.6	492.0	436.2	437.1	457.9	492.2	521.6	603.7	612.3	653.0	754.4	696.7	614.4
Estonia	45.3	54.5	50.2	63.2	74.9	57.6	67.9	79.3	73.2	79.4	101.7	101.9	122.6	90.1
Finland	394.1	464.1	453.6	464.0	486.7	455.4	500.7	542.5	531.6	507.0	564.1	567.8	604.6	501.3
France	4,399.1	4,500.2	4,617.0	4,847.3	4,750.9	5,124.1	4,997.8	5,199.1	5,335.3	5,243.7	5,458.4	5,256.9	5,354.4	4,954.8
Germany	5,960.8	6,698.5	6,792.4	6,952.9	7,048.5	7,228.5	7,453.3	7,876.2	8,419.1	8,447.2	8,486.8	8,722.4	8,834.1	8,220.5



Region, country, or economy	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Greece	461.0	497.5	524.9	646.2	610.6	620.4	635.2	578.5	607.9	560.0	592.7	547.8	571.1	526.8
Hungary	570.6	647.7	602.2	579.8	542.0	582.9	514.6	504.0	518.3	514.0	508.4	536.0	568.5	535.5
Ireland	217.2	210.3	244.5	249.8	294.5	334.2	338.1	440.2	478.2	477.1	469.1	438.9	417.4	355.8
Italy	2,982.5	3,184.8	3,335.0	3,233.0	3,384.8	3,431.7	3,664.3	3,617.9	3,865.2	3,689.3	4,108.2	4,013.7	4,159.6	3,943.1
Latvia	53.7	51.1	42.0	33.3	55.0	50.5	63.8	43.9	54.6	65.7	82.1	92.6	114.5	81.5
Lithuania	61.8	85.9	76.2	102.5	109.4	99.6	131.4	93.9	116.8	122.7	145.4	171.5	236.0	152.7
Luxembourg	2.5	2.2	4.5	5.8	6.7	10.7	12.9	15.8	32.1	30.1	31.9	39.5	26.6	32.5
Malta	1.8	0.3	2.0	1.3	1.5	0.5	1.0	2.1	1.0	0.8	2.0	5.5	9.9	4.1
Netherlands	1,149.2	1,289.6	1,372.2	1,308.8	1,188.6	1,242.6	1,325.1	1,337.4	1,394.1	1,283.1	1,410.7	1,285.7	1,234.5	1,309.3
Poland	2,127.6	2,093.1	2,200.6	2,345.1	2,398.1	2,382.8	2,348.0	2,279.4	2,547.2	2,916.9	3,057.0	2,840.4	3,106.5	2,975.6
Portugal	493.7	598.0	644.3	737.3	782.4	895.5	898.4	1,041.6	1,017.0	1,077.2	1,245.0	1,168.5	1,104.0	952.8
Romania	636.0	634.0	753.1	732.7	788.3	903.1	1,033.8	1,227.5	1,150.3	1,063.5	1,215.4	1,146.1	1,383.4	1,226.7
Slovakia	223.4	253.1	338.4	260.2	293.2	367.0	285.8	250.0	411.5	317.8	341.4	339.2	310.4	271.5
Slovenia	211.4	187.9	226.6	211.5	262.7	274.9	268.1	263.9	262.8	270.1	272.1	280.1	310.4	258.0
Spain	3,139.5	3,449.2	3,679.6	3,763.0	4,154.2	3,857.0	3,961.3	4,195.5	4,416.1	4,447.9	4,596.1	4,430.8	4,315.4	4,288.8
Sweden	936.9	1,048.2	979.3	1,061.9	956.3	898.7	918.2	986.1	968.5	1,013.5	1,095.1	1,188.9	1,138.8	1,118.4
United Kingdom	4,430.6	4,673.1	4,514.0	4,837.2	4,585.0	4,565.3	4,610.3	4,945.0	5,185.2	4,857.6	4,806.3	4,917.7	5,072.2	4,884.9
Other Europe	9,813.7	10,011.4	9,910.2	9,195.5	9,484.1	9,970.7	10,138.0	10,471.8	10,936.3	10,273.1	11,057.3	11,310.4	11,780.9	11,795.9
Albania	0.3	1.0	0.9	0.3	0.0	0.0	0.9	5.3	7.9	5.8	7.1	6.9	2.1	3.9



Region, country, or economy	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Andorra	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0
Belarus	193.3	186.8	167.9	189.2	150.4	142.9	150.5	153.7	171.9	140.6	123.2	130.8	122.8	104.4
Bosnia and Herzegovina	4.6	0.5	1.8	0.9	3.7	7.5	10.7	10.4	7.9	7.3	17.0	10.1	10.4	11.4
Holy See (Vatican City)	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Iceland	5.9	6.9	2.1	7.5	9.8	8.2	10.6	15.3	12.3	12.0	16.9	13.0	20.8	13.2
Kosovo	0.0	0.0	0.0	0.0	0.0	3.3	4.4	7.5	7.1	5.9	6.4	5.3	6.1	10.8
Liechtenstein	2.7	4.6	2.1	5.3	2.2	2.9	3.0	2.0	2.0	3.4	4.1	6.0	3.7	4.3
Macedonia	37.2	48.0	47.0	31.4	39.5	32.4	26.1	25.3	34.0	34.4	31.3	32.0	39.5	24.6
Moldova	43.3	43.3	50.6	41.2	27.4	54.0	51.7	47.3	52.8	48.1	36.3	45.2	35.4	47.6
Monaco	1.0	3.0	5.7	0.2	2.0	1.0	2.2	5.1	2.2	1.5	1.8	1.5	3.9	2.0
Montenegro ^a	na	na	na	na	2.2	4.1	2.4	1.3	4.6	4.1	6.9	4.9	5.4	3.8
Norway	194.1	262.8	302.6	348.8	320.5	316.7	291.6	333.4	371.5	332.6	344.5	362.1	358.7	356.6
Russia	6,286.0	5,947.3	5,784.2	4,912.7	5,067.9	5,455.0	5,372.8	5,550.0	5,896.7	5,169.8	5,626.2	5,881.0	6,382.0	6,737.6
San Marino	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serbia ^a	na	na	na	na	312.6	310.4	424.3	393.2	421.3	511.2	543.6	500.3	509.8	497.5
Serbia and Montenegro ^b	203.3	221.5	226.5	233.1	na	na	na	na	na	na	na	na	na	na
Switzerland	1,100.5	1,230.1	1,261.0	1,304.8	1,201.0	1,291.1	1,343.0	1,402.4	1,453.3	1,511.3	1,517.8	1,627.2	1,560.5	1,414.7
Turkey	912.6	1,183.6	1,217.9	1,419.4	1,663.0	1,593.3	1,739.9	1,774.1	1,751.7	1,766.2	1,990.5	1,902.9	1,931.3	1,940.4
Ukraine	829.0	872.3	839.4	700.9	681.8	747.8	704.0	745.3	739.1	719.1	783.6	781.1	788.4	623.0



Region, country, or economy	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Middle East	1,776.3	2,030.6	2,419.2	2,761.8	3,167.5	3,487.2	3,778.7	4,459.5	5,312.4	5,920.9	6,201.4	6,564.6	7,098.8	7,155.7
Armenia	44.0	56.4	59.6	56.6	55.1	63.9	46.8	67.2	50.2	48.8	52.7	58.9	64.2	55.5
Azerbaijan	50.8	60.1	93.6	64.9	50.0	63.8	141.1	127.8	129.4	98.9	101.1	63.6	57.5	65.5
Bahrain	5.0	2.3	0.9	4.0	1.0	1.8	2.0	1.3	3.8	2.5	4.5	2.3	3.5	2.5
Gaza Strip	17.2	15.5	13.8	10.6	22.9	16.6	18.6	6.5	13.0	12.8	9.7	9.4	13.5	5.3
Georgia	20.6	22.6	29.9	44.2	38.5	26.4	32.0	34.1	25.5	34.8	21.6	25.0	19.0	8.6
Iran	847.5	1,019.4	1,330.6	1,620.9	2,054.8	2,275.1	2,548.0	2,958.8	3,555.4	3,986.1	4,163.6	4,267.5	4,645.3	4,707.3
Iraq	7.5	7.5	14.9	13.2	25.0	22.6	22.7	36.6	44.9	68.3	88.6	97.7	87.0	98.5
Israel	534.8	545.2	566.7	591.1	538.0	605.5	549.7	595.2	632.5	552.6	608.3	622.4	672.2	679.1
Jordan	47.5	54.2	51.2	74.1	91.0	93.5	83.4	79.5	76.5	84.7	85.9	76.0	68.5	67.1
Kuwait	19.3	33.0	47.0	50.3	49.6	48.4	36.2	40.4	39.6	40.3	34.9	44.2	39.8	43.6
Lebanon	7.1	8.1	12.2	15.2	13.2	22.3	20.4	17.2	34.6	24.7	38.7	34.3	54.5	57.2
Oman	11.5	10.4	8.2	19.8	7.3	18.2	14.6	20.7	16.1	29.2	25.3	39.2	46.8	35.9
Qatar	4.7	14.6	11.3	6.6	7.3	15.2	8.5	21.1	32.0	30.4	33.4	64.5	78.9	98.7
Saudi Arabia	120.6	134.6	140.4	141.8	160.4	164.3	190.1	344.5	537.5	796.8	822.7	1,032.5	1,108.3	1,101.4
Syria	15.9	17.3	11.7	12.8	8.6	9.7	10.8	27.7	29.1	31.6	20.4	21.1	27.9	16.2
United Arab Emirates	14.0	13.8	21.2	27.0	32.8	21.6	27.2	44.9	65.4	57.7	74.2	79.4	91.4	95.9
West Bank	4.5	6.1	2.4	4.8	5.8	12.3	19.0	29.7	16.5	12.5	11.6	15.1	13.2	12.1
Yemen	3.8	9.5	3.6	4.3	6.3	6.1	7.7	6.6	10.5	8.1	4.3	11.7	7.1	5.2



Region, country, or economy	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Africa	1,326.8	1,417.4	1,405.8	1,682.4	1,868.2	1,819.8	2,002.1	2,239.3	2,547.3	2,607.2	2,732.0	2,761.1	3,017.1	3,143.6
Algeria	74.5	89.3	96.7	168.7	163.2	175.3	216.4	230.6	225.8	249.0	274.3	287.8	287.2	311.5
Angola	0.0	0.2	0.0	1.0	0.2	0.0	0.2	0.9	1.2	0.2	0.2	0.1	0.1	0.0
Benin	1.3	6.3	0.5	0.5	2.1	1.3	1.6	0.4	2.0	1.3	1.8	1.1	0.1	3.3
Botswana	11.8	21.8	13.1	18.9	14.1	14.6	12.9	6.6	10.1	11.5	8.2	14.1	6.9	10.3
Burkina Faso	0.2	5.5	0.0	0.3	3.8	2.1	6.2	2.5	4.9	6.2	3.9	3.2	3.6	5.4
Burundi	0.0	0.0	0.0	0.2	0.3	0.3	1.0	1.9	0.3	0.6	0.2	0.2	0.8	0.0
Cameroon	7.6	9.9	11.3	15.8	21.5	18.8	16.6	21.3	28.2	16.1	23.9	20.4	24.0	25.1
Cape Verde	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2
Central African Republic	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0
Chad	0.0	0.1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Comoros	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Congo, Democratic Republic of the	2.2	0.0	1.2	0.5	0.0	0.5	0.6	2.7	1.0	0.7	2.8	2.2	2.3	5.8
Congo, Republic of the	0.0	0.4	0.0	0.0	0.0	0.6	0.0	0.0	0.4	0.0	1.0	0.2	0.0	0.7
Côte d'Ivoire	2.7	4.4	5.0	3.7	10.7	7.9	12.2	10.0	10.9	5.3	5.3	6.0	5.1	12.9
Djibouti	0.0	0.0	0.0	0.0	0.3	0.2	0.3	0.7	1.1	0.0	1.3	0.4	0.5	0.1
Egypt	662.3	666.0	681.0	756.8	851.5	852.9	833.5	861.7	905.0	974.8	1,053.2	1,103.6	1,261.7	1,292.6
Equatorial Guinea	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eritrea	0.0	0.5	0.0	0.5	0.0	0.3	0.8	0.0	0.3	0.0	0.0	0.5	0.0	0.0



Region, country, or economy	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Ethiopia	4.7	3.5	3.5	8.4	6.0	7.8	6.6	13.4	15.9	23.4	20.4	23.4	26.2	22.7
Gabon	0.0	0.2	0.4	0.4	0.3	0.2	1.2	0.6	1.0	0.0	0.4	0.6	0.4	1.8
Gambia, The	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.1
Ghana	5.7	2.2	5.4	8.0	7.7	5.2	14.0	4.9	11.0	9.5	11.0	11.2	9.5	12.6
Guinea	0.0	0.8	0.0	0.1	0.0	0.5	0.2	0.0	0.0	0.5	1.0	0.3	0.7	0.1
Guinea-Bissau	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Kenya	11.3	9.3	7.8	2.8	6.0	3.5	10.7	7.3	11.1	17.0	13.0	2.5	5.6	14.0
Lesotho	0.0	1.1	0.0	1.0	1.3	1.0	0.0	0.0	0.3	1.0	0.0	1.0	0.3	2.0
Liberia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Libya	3.4	4.3	5.6	10.7	20.1	13.0	17.6	22.9	14.3	10.7	17.0	16.8	7.7	6.7
Madagascar	0.3	0.8	2.5	0.5	0.6	1.7	2.9	1.9	1.1	1.4	4.4	1.5	1.9	2.2
Malawi	0.0	0.0	0.0	0.0	0.7	0.0	0.1	0.9	0.2	0.1	0.1	0.0	0.4	0.0
Mali	0.0	1.0	0.0	1.6	0.0	0.3	0.3	0.3	0.3	0.2	0.3	0.5	0.0	1.3
Mauritania	0.5	1.2	0.7	0.5	0.9	1.5	1.7	0.3	0.6	0.2	0.2	0.2	0.2	0.2
Mauritius	6.0	4.9	3.9	5.5	7.5	5.7	6.0	7.3	4.9	10.1	9.7	5.4	14.1	8.1
Morocco	108.9	109.5	97.4	96.9	114.6	112.1	153.9	228.1	280.4	214.5	230.4	189.6	166.2	134.3
Mozambique	0.0	0.5	0.0	0.0	0.0	0.0	0.4	0.3	0.3	0.0	0.4	0.3	0.8	0.8
Namibia	0.3	0.0	0.0	0.9	0.5	0.0	0.0	0.3	0.6	0.1	0.2	0.7	1.3	0.4
Niger	0.0	1.3	0.4	0.0	1.5	0.0	0.0	2.3	2.0	0.1	0.0	0.2	0.0	1.0



Region, country, or economy	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nigeria	31.9	36.7	44.7	44.2	61.4	59.1	85.1	89.7	78.2	90.4	79.4	103.9	86.5	122.9
Rwanda	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1	0.0	0.3	0.8	0.1	1.0
São Tomé and Príncipe	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Senegal	8.8	4.6	7.2	5.3	10.9	9.1	12.6	10.9	20.0	20.0	21.6	24.4	22.4	14.8
Seychelles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2
Sierra Leone	0.0	0.3	0.0	0.2	0.0	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Somalia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0
South Africa	274.1	302.2	293.2	377.7	391.0	351.9	390.5	498.7	682.7	700.3	663.0	654.5	728.0	756.3
South Sudan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sudan	4.8	1.2	2.1	2.1	3.4	4.7	9.8	8.1	14.0	15.4	12.4	13.6	12.1	10.2
Swaziland	0.1	0.0	2.0	0.0	0.0	1.3	1.7	0.2	0.5	0.2	2.0	0.3	0.5	0.3
Tanzania	3.0	3.5	3.3	1.3	3.5	4.1	2.1	3.1	4.7	5.3	7.3	4.4	5.9	11.3
Togo	0.6	1.3	0.0	0.0	1.0	1.0	0.0	0.3	0.1	0.0	0.0	0.4	0.5	0.2
Tunisia	97.6	120.9	115.1	142.6	159.2	159.9	179.1	192.9	211.7	217.4	256.5	262.5	320.5	341.5
Uganda	0.0	0.7	0.6	0.0	0.4	1.3	2.3	2.1	0.1	2.6	0.4	0.5	5.5	0.9
Western Sahara	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Zambia	0.0	1.0	0.5	1.0	0.5	0.0	1.2	0.5	0.0	0.0	0.8	0.3	0.5	0.6
Zimbabwe	2.0	0.0	0.3	3.8	1.6	0.3	0.0	2.0	0.0	1.2	3.4	1.7	6.5	6.4
Asia	31,250.9	37,155.4	45,198.9	50,601.7	49,774.7	52,820.0	56,597.1	58,973.0	67,437.3	71,579.7	77,107.4	84,668.5	89,593.7	85,623.4



Region, country, or economy	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Afghanistan	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.2	0.0	0.5	0.0	0.0
Bangladesh	35.1	39.4	42.1	41.5	46.3	42.7	44.9	46.2	66.4	75.9	82.8	82.6	100.1	84.8
Bhutan	0.0	0.0	0.0	0.1	0.0	0.1	0.2	0.3	0.0	0.1	0.3	0.5	0.0	0.0
Brunei	2.4	4.3	1.5	2.1	1.2	1.9	0.5	2.6	4.0	8.2	4.0	6.5	10.0	11.2
Burma	0.8	1.7	1.5	0.2	1.1	0.1	2.3	1.0	0.0	1.0	0.0	0.0	1.6	2.8
Cambodia	0.0	0.0	0.0	0.0	0.0	0.5	0.3	1.2	0.1	0.1	0.0	0.1	0.3	0.8
China	11,632.6	15,439.5	19,067.7	22,132.3	24,677.1	26,244.3	29,237.8	30,279.0	35,418.0	38,300.4	43,240.2	49,335.4	53,344.0	52,423.6
India	4,724.2	5,300.5	5,633.5	6,705.5	7,296.7	7,433.2	7,914.4	8,432.2	9,803.8	10,392.5	10,848.1	12,045.7	12,180.1	11,173.3
Indonesia	11.5	18.5	36.2	23.6	22.4	29.7	36.6	48.5	56.8	114.5	115.6	128.3	166.4	188.6
Japan	9,753.0	10,390.8	14,079.0	14,303.5	10,302.9	10,278.1	10,110.4	9,556.5	10,054.9	10,137.6	10,277.1	9,865.3	9,859.0	8,832.8
Kazakhstan	67.7	74.8	75.5	66.3	48.6	66.1	65.2	73.7	50.4	63.6	91.8	93.5	78.9	111.7
Kyrgyzstan	1.0	0.2	4.0	1.5	1.0	0.2	3.8	0.5	2.1	3.0	2.8	1.3	1.6	2.2
Laos	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.2	0.4	0.0	0.0	0.4	0.3	0.3
Malaysia	165.1	201.1	244.3	283.5	329.7	465.4	605.4	960.8	1,172.9	1,171.4	1,045.9	1,117.9	1,547.9	1,461.7
Maldives	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	1.0	0.0	0.0
Mongolia	0.5	1.9	1.6	0.0	2.4	30.6	1.9	0.9	3.6	2.8	4.6	2.7	2.9	1.0
Nepal	0.4	1.0	4.0	2.4	1.1	1.4	2.0	4.7	5.6	7.6	7.0	4.2	7.7	11.7
North Korea	0.0	3.4	0.2	3.0	3.8	0.6	2.1	0.4	0.1	1.5	0.6	1.4	3.5	8.3
Pakistan	151.7	192.4	234.1	338.7	373.8	486.7	562.7	676.7	603.9	670.4	723.9	590.8	703.7	687.5



Region, country, or economy	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Papua New Guinea	0.2	0.0	0.1	0.5	1.5	0.0	1.3	0.5	0.3	0.5	0.5	0.4	1.0	1.4
Philippines	7.8	4.4	11.1	5.6	8.2	10.2	7.2	15.5	22.2	20.5	21.7	30.9	40.8	34.2
Singapore	432.7	584.9	598.9	618.2	604.7	805.7	863.2	1,000.4	1,237.5	1,269.3	1,313.3	1,391.6	1,384.5	1,294.2
South Korea	2,548.5	2,904.3	2,990.2	3,600.0	3,698.9	4,274.3	4,257.3	4,873.4	5,450.7	5,802.4	5,811.6	6,431.9	6,801.8	6,204.9
Sri Lanka	8.2	7.8	14.1	13.5	9.6	11.7	14.8	11.0	12.7	20.9	17.4	28.9	25.6	25.9
Taiwan	1,433.7	1,665.4	1,825.0	2,062.3	1,920.9	2,156.8	2,354.1	2,377.6	2,712.4	2,757.4	2,675.5	2,660.9	2,416.4	2,191.0
Tajikistan	7.0	10.0	3.2	5.3	9.0	10.2	7.7	9.2	8.5	5.5	13.7	5.1	6.2	12.8
Thailand	179.6	204.5	242.6	327.8	337.3	401.7	417.9	441.6	513.5	561.0	589.8	621.6	659.9	588.0
Timor-Leste	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Turkmenistan	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2
Uzbekistan	80.0	94.2	77.4	55.2	55.8	51.3	52.6	74.4	101.7	60.0	58.2	40.7	37.6	39.5
Vietnam	7.1	10.6	10.5	9.4	20.7	16.3	30.5	83.9	133.9	131.3	161.1	178.6	211.7	229.0
Australia and Oceania	1,411.7	1,468.6	1,539.1	1,854.2	1,637.0	1,706.3	1,890.0	2,260.8	2,397.7	2,367.5	2,555.2	2,636.6	2,870.3	2,545.8
Australia	1,234.1	1,278.4	1,321.6	1,616.0	1,408.4	1,470.4	1,624.9	1,997.9	2,088.8	2,102.9	2,245.4	2,339.8	2,562.6	2,285.8
Cook Islands	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Fiji	2.3	4.7	7.3	4.3	3.9	3.3	5.6	0.7	4.1	1.2	3.8	2.8	3.1	1.3
Kiribati	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Marshall Islands	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Micronesia, Federated States of	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	0.0	0.2	0.0



Region, country, or economy	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Nauru	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
New Zealand	175.3	185.3	209.8	233.7	224.7	232.6	259.5	261.5	304.8	263.3	305.0	294.0	304.5	258.8
Niue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Palau	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Samoa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Solomon Islands	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tonga	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tuvalu	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vanuatu	0.0	0.3	0.3	0.0	0.0	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0
Unassigned	290.6	300.3	332.6	239.4	224.3	254.2	154.9	153.4	125.8	115.6	156.7	114.9	71.7	60.7

na = not applicable; country data do not exist.

EU = European Union.

^a Beginning in 2006, Serbia and Montenegro represented individual countries.

^b Serbia and Montenegro represented a single country for data purposes from 1992 to 2006.

Note(s)

Article counts refer to publications from a selection of journals, books, and conference proceedings in S&E from Scopus. Articles are classified by their year of publication and are assigned to a region, country, or economy on the basis of the institutional address(es) listed in the article. Articles are credited on a fractional-count basis. The sum of the regions, countries, or economies may not add to the world total because of rounding. Some publications have incomplete address information for coauthored publications in the Scopus database. The unassigned category count is the sum of fractional counts for publications that cannot be assigned to a region, country, or economy.

Source(s)

National Science Foundation, National Center for Science and Engineering Statistics; SRI International; Science-Metrix; Elsevier, Scopus abstract and citation database, accessed July 2017.



Science and Engineering Indicators 2018